
AMD SMI
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The AMD System Management Interface (AMD SMI) library offers a unified tool for managing and monitoring GPUs, particularly in high-performance computing environments. It provides a user-space interface that allows applications to control GPU operations, monitor performance, and retrieve information about the system's drivers and GPUs.

Find the source code at <https://github.com/ROCm/amdsmi>.

Note

AMD SMI is the successor to https://github.com/ROCm/rocm_smi_lib.

Install

- *Library and CLI tool installation*
- *Build from source*

How to

- *C++ library usage*
- *Python library usage*
- *Go library usage*
- *CLI tool usage*
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Reference

- *C++ API*
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Tutorials

- [AMD SMI examples \(GitHub\)](#)
- [AMD SMI CLI walkthrough](#)

To learn about contributing to AMD SMI, see [Contributing to AMD SMI](#). To contribute to the documentation, see [Contributing to ROCm documentation](#).

Find ROCm licensing information on the [Licensing](#) page.

AMD SMI LIBRARY AND CLI TOOL

This section describes how to install the AMD SMI library, Python interface, and command line tool either as part of the ROCm software stack – or manually.

1.1 Requirements

The following are required to install and use the AMD SMI library through its language interfaces and CLI.

- The `amdgpu` driver must be loaded for AMD SMI initialization to work.
- Export `LD_LIBRARY_PATH` to the `amdsmi` installation directory.

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/rocm/lib:/opt/rocm/lib64
```

1.1.1 Python interface and CLI tool prerequisites

- Python version 3.6.8 or greater (64-bit)

1.1.2 Note: No module named `more_itertools` warning on Azure Linux 3

During the driver installation process on Azure Linux 3, you might encounter the `ModuleNotFoundError: No module named 'more_itertools'` warning. This warning is a result of the reintroduction of `python3-wheel` and `python3-setuptools` dependencies in the CMake of AMD SMI, which requires `more_itertools` to build these Python libraries. This issue will be fixed in a future ROCm release. As a workaround, use the following command before installation:

```
sudo python3 -m pip install more_itertools
```

1.1.3 Go interface prerequisites

- Go version 1.20 or greater

1.1.4 Supported platforms

At initial release, the AMD SMI library will support Linux bare metal and Linux virtual machine guest for AMD GPUs. In a future release, the library will be extended to support AMD EPYC™ CPUs.

AMD SMI library can run on AMD ROCm supported platforms, refer to System requirements (Linux) for more information.

To run the AMD SMI library, the `amdgpu` driver and the `amd_hsmmp` driver need to be installed. Optionally, `libdrm` can be installed to query firmware information and hardware IPs.

1.2 Install amdgpu driver and AMD SMI with ROCm

1. Get the `amdgpu-install` installer following the instructions for your Linux distribution at `rocm-install-on-linux:install/amdgpu-install`.

See the following example; your desired ROCm release and install URL may be different.

```
sudo apt update
wget https://repo.radeon.com/amdgpu-install/6.2.2/ubuntu/noble/amdgpu-install_6.2.
↳60202-1_all.deb
sudo apt install ./amdgpu-install_6.2.60202-1_all.deb
```

2. Use `amdgpu-install` to install the `amdgpu` driver and ROCm packages with AMD SMI included.

```
sudo amdgpu-install --usecase=rocm
```

The `amdgpu-install --usecase=rocm` option triggers both an `amdgpu` driver update and AMD SMI packages to be installed on your device.

3. Verify your installation.

```
amd-smi --help
```

1.3 Install AMD SMI without ROCm

The following are example steps to install the AMD SMI libraries and CLI tool on Ubuntu 22.04.

1. Install the library.

```
sudo apt install amd-smi-lib
```

2. Add the installation directory to your PATH. If installed with ROCm, ignore this step.

```
export PATH="${PATH:+${PATH}:}~/opt/rocm/bin"
```

3. Verify your installation.

```
amd-smi --help
```

1.4 Optionally enable CLI autocompletion

The `amd-smi` CLI application supports autocompletion. If `argcomplete` is not installed and enabled already, do so using the following commands.

```
python3 -m pip install argcomplete
activate-global-python-argcomplete --user
# restart shell to enable
```

1.5 Install the Python library for multiple ROCm instances

If multiple ROCm versions are installed and you are not using `pyenv`, uninstall previous versions of AMD SMI before installing the desired version from your ROCm instance.

1.5.1 Manually install the Python library

The following are example AMD SMI installation steps on Ubuntu 22.04 without ROCm.

1. Remove previous AMD SMI installation.

```
python3 -m pip list | grep amd
python3 -m pip uninstall amdsmi
```

2. Install the AMD SMI Python library from your target ROCm instance.

```
apt install amd-smi-lib
cd /opt/rocm/share/amd_smi
python3 -m pip install --upgrade pip
python3 -m pip install --user .
```

3. You should now have the AMD SMI Python library in your Python path:

```
~$ python3
Python 3.8.10 (default, May 26 2023, 14:05:08)
[GCC 9.4.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import amdsmi
>>>
```


BUILDING AMD SMI

This section describes the prerequisites and steps to build AMD SMI from source.

2.1 Required software

To build the AMD SMI library, the following components are required. Note that the software versions specified were used during development; earlier versions are not guaranteed to work.

- CMake (v3.15.0 or later) – `python3 -m pip install cmake`
- g++ (v5.4.0 or later)
- libdrm-dev (for Ubuntu and Debian)
- libdrm-devel (for RPM-based distributions)

In order to build the AMD SMI Python package, the following components are required:

- Python (3.6.8 or later)
- virtualenv – `python3 -m pip install virtualenv`

2.2 Build steps

1. Clone the AMD SMI repository to your local Linux machine.

```
git clone https://github.com/ROCm/amdsmi.git
```

2. The default installation location for the library and headers is `/opt/rocm`. Before installation, any old ROCm directories should be deleted:

- `/opt/rocm`
- `/opt/rocm-<version_number>`

3. Build the library by following the typical CMake build sequence (run as root user or use `sudo` before `make install` command); for instance:

```
mkdir -p build
cd build
cmake ..
make -j $(nproc)
make install
```

The built library is located in the `build/` directory. To build the rpm and deb packages use the following command:

```
make package
```

2.3 Rebuild the Python wrapper

The Python wrapper for the AMD SMI library is found in the *auto-generated file* `py-interface/amdsmi_wrapper.py`. It is essential to regenerate this wrapper whenever there are changes to the C++ API. It is not regenerated automatically.

To regenerate the wrapper, use the following command.

```
./update_wrapper.sh
```

After this command, the file in `py-interface/amdsmi_wrapper.py` will be updated on compile.

Note

You need Docker installed on your system to regenerate the Python wrapper.

2.4 Build the tests

To verify the build and capabilities of AMD SMI on your system, as well as to see practical examples of its usage, you can build and run the available [tests in the repository](#). Follow these steps to build the tests:

```
mkdir -p build
cd build
cmake -DBUILD_TESTS=ON ..
make -j $(nproc)
```

2.4.1 Run the tests

Once the tests are *built*, you can run them by executing the `amdsmitst` program. The executable can be found at `build/tests/amd_smi_test/`.

2.5 Build the docs

To build the documentation, follow the instructions at [Building documentation](#).

AMD SMI C++ LIBRARY USAGE AND EXAMPLES

This section presents a brief overview and some basic examples on the AMD SMI library's usage. Whether you are developing applications for performance monitoring, system diagnostics, or resource allocation, the AMD SMI C++ library serves as a valuable tool for leveraging the full potential of AMD hardware in your projects.

Note

`hipcc` and other compilers will not automatically link in the `libamd_smi` dynamic library. To compile code that uses the AMD SMI library API, ensure the `libamd_smi.so` can be located by setting the `LD_LIBRARY_PATH` environment variable to the directory containing `librocm_smi64.so` (usually `/opt/rocm/lib`) or by passing the `-lamd_smi` flag to the compiler.

Note

The environment variable `AMDSMI_GPU_METRICS_CACHE_MS` may be set to control the internal GPU metrics cache duration (ms). Default 1, set to 0 to disable.

See also

Refer to the *C++ library API reference*.

3.1 Device and socket handles

Many functions in the library take a *socket handle* or *device handle*. A *socket* refers to a physical hardware socket, abstracted by the library to represent the hardware more effectively to the user. While there is always one unique GPU per socket, an APU may house both a GPU and CPU on the same socket. For MI200 GPUs, multiple GCDs may reside within a single socket

To identify the sockets in a system, use the `amdsmi_get_socket_handles()` function, which returns a list of socket handles. These handles can then be used with `amdsmi_get_processor_handles()` to query devices within each socket. The device handle is used to differentiate between detected devices; however, it's important to note that a device handle may change after restarting the application, so it should not be considered a persistent identifier across processes.

The list of socket handles obtained from `amdsmi_get_socket_handles()` can also be used to query the CPUs in each socket by calling `amdsmi_get_processor_handles_by_type()`. This function can then be called again to query the cores within each CPU.

3.2 Hello AMD SMI

An application using AMD SMI must call `amdsmi_init()` to initialize the AMD SMI library before all other calls. This call initializes the internal data structures required for subsequent AMD SMI operations. In the call, a flag can be passed to indicate if the application is interested in a specific device type.

`amdsmi_shut_down()` must be the last call to properly close connection to driver and make sure that any resources held by AMD SMI are released.

1. A simple “Hello World” type program that displays the temperature of detected devices.

Sample build example:

```
$ g++ -I/opt/rocm/include <file_name>.cc -L/opt/rocm/lib -lamd_smi -o <filename>
```

Users `/opt/rocm-*/bin` path may differ (depending on install), please locate the `libamd_smi.so.*` path of your `libamd_smi.so.*`.

For example:

```
$ sudo find /opt/ -iname libamd_smi.so*
/opt/rocm-6.4.1/lib/libamd_smi.so.25.0
/opt/rocm-6.4.1/lib/libamd_smi.so
```

The code is as follows:

```
#include <iostream>
#include <vector>
#include "amd_smi/amdsmi.h"

int main() {
    amdsmi_status_t ret;

    // Init amdsmi for sockets and devices. Here we are only interested in AMD_GPUS.
    ret = amdsmi_init(AMDSMI_INIT_AMD_GPUS);

    // Get all sockets
    uint32_t socket_count = 0;

    // Get the socket count available in the system.
    ret = amdsmi_get_socket_handles(&socket_count, nullptr);

    // Allocate the memory for the sockets
    std::vector<amdsmi_socket_handle> sockets(socket_count);
    // Get the socket handles in the system
    ret = amdsmi_get_socket_handles(&socket_count, &sockets[0]);

    std::cout << "Total Socket: " << socket_count << std::endl;

    // For each socket, get identifier and devices
    for (uint32_t i=0; i < socket_count; i++) {
        // Get Socket info
        char socket_info[128];
        ret = amdsmi_get_socket_info(sockets[i], 128, socket_info);
        std::cout << "Socket " << socket_info << std::endl;
    }
}
```

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```

// Get the device count for the socket.
uint32_t device_count = 0;
ret = amdsmi_get_processor_handles(sockets[i], &device_count, nullptr);

// Allocate the memory for the device handlers on the socket
std::vector<amdsmi_processor_handle> processor_handles(device_count);
// Get all devices of the socket
ret = amdsmi_get_processor_handles(sockets[i],
    &device_count, &processor_handles[0]);

// For each device of the socket, get name and temperature.
for (uint32_t j=0; j < device_count; j++) {
    // Get device type. Since the amdsmi is initialized with
    // AMD_SMI_INIT_AMD_GPUS, the processor_type must be AMDSMI_PROCESSOR_TYPE_
    ↪AMD_GPU.
    processor_type_t processor_type;
    ret = amdsmi_get_processor_type(processor_handles[j], &processor_type);
    if (processor_type != AMDSMI_PROCESSOR_TYPE_AMD_GPU) {
        std::cout << "Expect AMDSMI_PROCESSOR_TYPE_AMD_GPU device type!\n";
        return 1;
    }

    // Get device name
    amdsmi_board_info_t board_info;
    ret = amdsmi_get_gpu_board_info(processor_handles[j], &board_info);
    std::cout << "\tdevice "
        << j << "\n\t\tName:" << board_info.product_name << std::endl;

    // Get temperature
    int64_t val_i64 = 0;
    ret = amdsmi_get_temp_metric(processor_handles[j], AMDSMI_TEMPERATURE_TYPE_
    ↪EDGE,
        AMDSMI_TEMP_CURRENT, &val_i64);
    std::cout << "\t\tTemperature: " << val_i64 << "C" << std::endl;
}
}

// Clean up resources allocated at amdsmi_init. It will invalidate sockets
// and devices pointers
ret = amdsmi_shut_down();

return 0;
}

```

2. A sample program that displays the power of detected CPUs.

Sample build example:

```

$ g++ -DENABLE_ESMI -I/opt/rocm/include <file_name>.cc -L/opt/rocm/lib -lamd_smi -o
    ↪<filename>

```

For finding available rocm include and library path, see building example on sample_↪
 ↪program 1 above.

The code is as follows:

```

#include <iostream>
#include <vector>
#include "amd_smi/amdsmi.h"

int main(int argc, char **argv) {
    amdsmi_status_t ret;
    uint32_t socket_count = 0;

    // Initialize amdsmi for AMD CPUs
    ret = amdsmi_init(AMDSMI_INIT_AMD_CPUS);

    ret = amdsmi_get_socket_handles(&socket_count, nullptr);

    // Allocate the memory for the sockets
    std::vector<amdsmi_socket_handle> sockets(socket_count);

    // Get the sockets of the system
    ret = amdsmi_get_socket_handles(&socket_count, &sockets[0]);

    std::cout << "Total Socket: " << socket_count << std::endl;

    // For each socket, get cpus
    for (uint32_t i = 0; i < socket_count; i++) {
        uint32_t cpu_count = 0;

        // Set processor type as AMDSMI_PROCESSOR_TYPE_AMD_CPU
        processor_type_t processor_type = AMDSMI_PROCESSOR_TYPE_AMD_CPU;
        ret = amdsmi_get_processor_handles_by_type(sockets[i], processor_type, &
        → nullptr, &cpu_count);

        // Allocate the memory for the cpus
        std::vector<amdsmi_processor_handle> plist(cpu_count);

        // Get the cpus for each socket
        ret = amdsmi_get_processor_handles_by_type(sockets[i], processor_type, &
        → plist[0], &cpu_count);

        for (uint32_t index = 0; index < plist.size(); index++) {
            uint32_t socket_power;
            std::cout << "CPU " << index << "\t" << std::endl;
            std::cout << "Power (Watts): ";

            ret = amdsmi_get_cpu_socket_power(plist[index], &socket_power);
            if (ret != AMDSMI_STATUS_SUCCESS)
                std::cout << "Failed to get cpu socket power" << "[" << index << "], Err[" <<
        → ret << "]" << std::endl;

            if (!ret) {
                std::cout << static_cast<double>(socket_power)/1000 << std::endl;
            }
            std::cout << std::endl;
        }
    }
}

```

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```
    }  
}  
  
// Clean up resources allocated at amdsmi_init  
ret = amdsmi_shut_down();  
  
return 0;  
}
```


AMD SMI PYTHON INTERFACE OVERVIEW

The AMD SMI Python interface provides a convenient way to interact with AMD hardware through a simple and accessible *API*.

See also

Refer to the *Python library API reference*.

4.1 Prerequisites

Before get started, make sure your environment satisfies the following prerequisites. See the *requirements* section for more information.

1. Ensure amdgpu drivers are installed properly for initialization.
2. Export LD_LIBRARY_PATH to the amdsmi installation directory.

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/rocm/lib:/opt/rocm/lib64:
```

3. Install Python 3.6.8+.

4.2 Get started

Note

hipcc and other compilers will not automatically link in the libamd_smi dynamic library. To compile code that uses the AMD SMI library API, ensure the libamd_smi.so can be located by setting the LD_LIBRARY_PATH environment variable to the directory containing librocm_smi64.so (usually /opt/rocm/lib) or by passing the -lamd_smi flag to the compiler.

Note

The environment variable AMDSMI_GPU_METRICS_CACHE_MS may be set to control the internal GPU metrics cache duration (ms). Default 1, set to 0 to disable.

You can apply it in one of two ways:

1. In Python code (before the AMDSMI library loads):

```
import os
os.environ["AMD_SMI_GPU_METRICS_CACHE_MS"] = "200"
from amdsmi import *
```

Note

2. On the shell when invoking Python:

```
AMD_SMI_GPU_METRICS_CACHE_MS=200 python tools/amdsmi_quick_start.py
```

To get started, the `amdsmi` folder should be copied and placed next to the importing script. Import it as follows:

```
from amdsmi import *

try:
    amdsmi_init()

    # amdsmi calls ...

except AmdSmiException as e:
    print(e)
finally:
    try:
        amdsmi_shut_down()
    except AmdSmiException as e:
        print(e)
```

4.2.1 Folder structure

File name	Description
<code>__init__.py</code>	Python package initialization file
<code>amdsmi_interface.py</code>	Amdsmi library Python interface
<code>amdsmi_wrapper.py</code>	Python wrapper around amdsmi binary
<code>amdsmi_exception.py</code>	Amdsmi <i>exceptions</i> Python file

4.3 Usage

An application using AMD SMI must call `amdsmi_init()` to initialize the AMD SMI library before all other calls. This call initializes the internal data structures required for subsequent AMD SMI operations. In the call, a flag can be passed to indicate if the application is interested in a specific device type.

`amdsmi_shut_down()` must be the last call to properly close connection to driver and make sure that any resources held by AMD SMI are released.

See also

Refer to the *Python library API reference*.

4.4 Exceptions

All exceptions are in `amdsmi_exception.py` file.

Exceptions that can be thrown by AMD SMI are:

- `AmdSmiException`: base `amdsmi` exception class
- `AmdSmiLibraryException`: derives base `AmdSmiException` class and represents errors that can occur in `amdsmi-lib`. When this exception is thrown, `err_code` and `err_info` are set. `err_code` is an integer that corresponds to errors that can occur in `amdsmi-lib` and `err_info` is a string that explains the error that occurred.

For example:

```
try:
    num_of_GPUs = len(amdsmi_get_processor_handles())
    if num_of_GPUs == 0:
        print("No GPUs on machine")
except AmdSmiException as e:
    print("Error code: {}".format(e.err_code))
    if e.err_code == amdsmi_wrapper.AMDSMI_STATUS_RETRY:
        print("Error info: {}".format(e.err_info))
```

- `AmdSmiRetryException`: Derives `AmdSmiLibraryException` class and signals device is busy and call should be retried.
- `AmdSmiTimeoutException`: Derives `AmdSmiLibraryException` class and represents that call had timed out.
- `AmdSmiParameterException`: Derives base `AmdSmiException` class and represents errors related to invalid parameters passed to functions. When this exception is thrown, `err_msg` is set and it explains what is the actual and expected type of the parameters.
- `AmdSmiBdfFormatException`: Derives base `AmdSmiException` class and represents invalid bdf format.

AMD SMI GO INTERFACE OVERVIEW

The AMD SMI Go interface provides a convenient way to interact with AMD hardware through a simple and accessible *API*. The API is compatible with Go 1.20 and higher and requires the AMD driver to be loaded for initialization. Review the *prerequisites*.

See also

Refer to the *Go library API reference*.

5.1 Prerequisites

Before get started, make sure your environment satisfies the following prerequisites. See the *requirements* section for more information.

1. Ensure amdgpu drivers are installed properly for initialization.
2. Export LD_LIBRARY_PATH to the amdsmi installation directory.

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/rocm/lib:/opt/rocm/lib64:
```

3. Install Go 1.20+.

Download Go from <https://go.dev/dl/> and follow the official installation documentation at [Download and install](#). Alternatively, use a third-party utility like update-golang.

```
git clone https://github.com/udhos/update-golang
cd update-golang
sudo ./update-golang.sh
source /etc/profile.d/golang_path.sh
go version
```

5.2 Get started

Note

hipcc and other compilers will not automatically link in the libamd_smi dynamic library. To compile code that uses the AMD SMI library API, ensure the libamd_smi.so can be located by setting the LD_LIBRARY_PATH environment variable to the directory containing librocm_smi64.so (usually /opt/rocm/lib) or by passing the -lamd_smi flag to the compiler.

A Go application using AMD SMI must call `goamdsmi.GO_gpu_init()` to initialize the AMD SMI library before all other calls. This call initializes the internal data structures required for subsequent AMD SMI operations.

`goamdsmi.GO_gpu_shutdown()` must be the last call to properly close connection to driver and make sure that any resources held by AMD SMI are released.

5.3 Usage

For an example on using the AMD SMI Go API, refer to this implementation https://github.com/amd/amd_smi_exporter/tree/master.

See also

Refer to the *Go library API reference*.

5.3.1 Add AMD SMI library to your project

To include the AMD SMI Go API in your project, update your Makefile or Go module configuration to fetch the appropriate version of the AMD SMI library.

```
go get github.com/ROCm/amdsmi@amd-staging
```

When using a Makefile, ensure you're fetching the latest AMD SMI repository with Go API support. See https://github.com/amd/amd_smi_exporter/blob/master/src/Makefile for an example implementation.

AMD SMI CLI TOOL USAGE

This tool is a command line interface (CLI) for manipulating and monitoring the `amdgpu` kernel; it is intended to replace and deprecate the existing `rocm_smi` CLI tool and `gpubv-smi` tool. The AMD SMI CLI tool uses Ctypes to call the `amd_smi_lib` API.

When using the CLI tool, you should have at least one AMD GPU and the driver installed.

Disclaimer

The AMD SMI CLI tool is provided as an example code to aid the development of telemetry tools. The *Python* or *C++ library* is recommended as a robust data source.

6.1 Install the CLI Tool and Python library

Refer to the *installation instructions*.

6.2 Get started

The `amd-smi` command provides system management and monitoring capabilities for AMD hardware. When run without arguments, it reports the version and platform detected:

```
~$ amd-smi
usage: amd-smi [-h] ...

AMD System Management Interface | Version: 26.0.2 | ROCm version: 7.0.2 | Platform: ↵
↳Linux Baremetal

options:
  -h, --help            show this help message and exit

AMD-SMI Commands:
  version               Descriptions:
                        Display version information
  list                  List GPU information
  static                Gets static information about the specified GPU
  firmware (ucode)     Gets firmware information about the specified GPU
  bad-pages             Gets bad page information about the specified GPU
  metric                Gets metric/performance information about the specified GPU
  process               Lists general process information running on the specified GPU
  event                 Displays event information for the given GPU
```

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topology	Displays topology information of the devices
set	Set options for devices
reset	Reset options for devices
monitor (dmon)	Monitor metrics for target devices
xgmi	Displays xgmi information of the devices
partition	Displays partition information of the devices
ras	Retrieve RAS (CPER) entries from the driver

Example commands:

```
amd-smi static --gpu 0
amd-smi metric
amd-smi process --gpu 0 1
amd-smi reset --gpureset --gpu all
```

Note

For command-specific help, use `amd-smi [command] --help` for see more detailed usage information. See *Commands*.

For more detailed version information, use `amd-smi version`.

Environment variables:

You can set one or more variables in front of any `amd-smi` invocation. For example:

```
AMDSMI_GPU_METRICS_CACHE_MS=200 amd-smi metric
```

Current Variables:

Note

`AMDSMI_GPU_METRICS_CACHE_MS` - Controls the internal GPU metrics cache duration (ms). Default 100, set to 0 to disable.

6.3 Commands

The following are the help output for each command, providing quick reference details for usage.

6.3.1 amd-smi list

Lists GPU information.

```
~$ amd-smi list --help
usage: amd-smi list [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                  [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]

Lists all detected devices on the system.
Lists the BDF, UUID, KFD_ID, NODE_ID, and Partition ID for each GPU and/or CPUs.
In virtualization environments, it can also list VFs associated to each
GPU with some basic information for each VF.
```

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```

List Arguments:
  -h, --help          show this help message and exit
  -e                  Enumeration mapping to other features.
                      Includes CARD, RENDER, HSA_ID, HIP_ID, and HIP_UUID.

Device Arguments:
  -g, --gpu GPU [GPU ...] Select a GPU ID, BDF, or UUID from the possible choices:
                          ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳ XXXXXXXXXXXXXXXX
                          ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳ XXXXXXXXXXXXXXXX
                          ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳ XXXXXXXXXXXXXXXX
                          ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳ XXXXXXXXXXXXXXXX
                          all | Selects all devices
  -U, --cpu CPU [CPU ...] Select a CPU ID from the possible choices:
                          ID: 0
                          ID: 1
                          ID: 2
                          ID: 3
                          all | Selects all devices
  -O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                          ID: 0 - 95
                          all | Selects all devices

Command Modifiers:
  --json              Displays output in JSON format (human readable by
↳ default).
  --csv               Displays output in CSV format (human readable by default).
  --file FILE         Saves output into a file on the provided path (stdout by
↳ default).
  --loglevel LEVEL    Set the logging level from the possible choices:
                      DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.2 amd-smi static

Gets static information about the specified GPU. See the *sample output* for `amd-smi static`.

```

~$ amd-smi static --help
usage: amd-smi static [-h] [-g GPU [GPU ...] | -U CPU [CPU ...]] [-a] [-b] [-V] [-d] [-v]
                    [-c] [-B] [-R] [-r] [-p] [-l] [-P] [-x] [-u] [-s] [-i]
                    [--json | --csv] [--file FILE] [--loglevel LEVEL]

```

If no GPU is specified, returns static information for all GPUs on the system.
If no static argument is provided, all static information will be displayed.

```

Static Arguments:
  -h, --help          show this help message and exit
  -a, --asic          All asic information
  -b, --bus           All bus information

```

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-V, --vbios	All video bios information (if available)
-d, --driver	Displays driver version
-v, --vram	All vram information
-c, --cache	All cache information
-B, --board	All board information
-R, --process-isolation	The process isolation status
-r, --ras	Displays RAS features information; Sudo may be required for some features
-C, --clock [CLOCK ...]	Show one or more valid clock frequency levels. Available ↵
↵options:	
	SYS, DF, DCEF, SOC, MEM, VCLK0, VCLK1, DCLK0, DCLK1, ALL
-p, --partition	Partition information
-l, --limit	All limit metric values (i.e. power and thermal limits)
-P, --soc-pstate	The available soc pstate policy
-x, --xgmi-plpd	The available XGMI per-link power down policy
-u, --numa	All numa node information
CPU Arguments:	
-s, --smu	All SMU FW information
-i, --interface-ver	Displays hsmp interface version
Device Arguments:	
-g, --gpu GPU [GPU ...]	Select a GPU ID, BDF, or UUID from the possible choices:
↵XXXXXXXXXXXX	ID: 0 BDF: 0000:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↵XXXXXXXXXXXX	ID: 1 BDF: 0001:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↵XXXXXXXXXXXX	ID: 2 BDF: 0002:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↵XXXXXXXXXXXX	ID: 3 BDF: 0003:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
	all Selects all devices
-U, --cpu CPU [CPU ...]	Select a CPU ID from the possible choices:
	ID: 0
	ID: 1
	ID: 2
	ID: 3
	all Selects all devices
Command Modifiers:	
--json	Displays output in JSON format (human readable by ↵
↵default).	
--csv	Displays output in CSV format (human readable by default).
--file FILE	Saves output into a file on the provided path (stdout by ↵
↵default).	
--loglevel LEVEL	Set the logging level from the possible choices: DEBUG, INFO, WARNING, ERROR, CRITICAL

6.3.3 amd-smi firmware

Gets firmware information about the specified GPU.

```

~$ amd-smi firmware --help
usage: amd-smi firmware [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                        [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]] [-f]

If no GPU is specified, return firmware information for all GPUs on the system.

Firmware Arguments:
  -h, --help                show this help message and exit
  -f, --ucode-list, --fw-list All FW list information

Device Arguments:
  -g, --gpu GPU [GPU ...]  Select a GPU ID, BDF, or UUID from the possible choices:
                           ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           all | Selects all devices
  -U, --cpu CPU [CPU ...]  Select a CPU ID from the possible choices:
                           ID: 0
                           ID: 1
                           ID: 2
                           ID: 3
                           all | Selects all devices
  -O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                           ID: 0 - 95
                           all | Selects all devices

Command Modifiers:
  --json                    Displays output in JSON format (human readable by ↪
                           ↪default).
  --csv                     Displays output in CSV format (human readable by default).
  --file FILE              Saves output into a file on the provided path (stdout by ↪
                           ↪default).
  --loglevel LEVEL        Set the logging level from the possible choices:
                           DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.4 amd-smi bad-pages

Gets bad page information about the specified GPU.

```

~$ amd-smi bad-pages --help
usage: amd-smi bad-pages [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                        [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]] [-p]
                        [-r] [-u]

```

If no GPU is specified, return bad page information for all GPUs on the system.

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```

Bad Pages Arguments:
  -h, --help           show this help message and exit
  -p, --pending        Displays all pending retired pages
  -r, --retired        Displays retired pages
  -u, --un-res         Displays unreservable pages

Device Arguments:
  -g, --gpu GPU [GPU ...] Select a GPU ID, BDF, or UUID from the possible choices:
                          ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                          ↪XXXXXXXXXXXXX
                          ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                          ↪XXXXXXXXXXXXX
                          ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                          ↪XXXXXXXXXXXXX
                          ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                          ↪XXXXXXXXXXXXX
                          all | Selects all devices
  -U, --cpu CPU [CPU ...] Select a CPU ID from the possible choices:
                          ID: 0
                          ID: 1
                          ID: 2
                          ID: 3
                          all | Selects all devices
  -O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                          ID: 0 - 95
                          all | Selects all devices

Command Modifiers:
  --json                Displays output in JSON format (human readable by default).
  --csv                 Displays output in CSV format (human readable by default).
  --file FILE           Saves output into a file on the provided path (stdout by
  ↪default).
  --loglevel LEVEL      Set the logging level from the possible choices:
                          DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.5 amd-smi metric

Gets metrics and performance information about the specified GPU.

```

~$ amd-smi metric --help
usage: amd-smi metric [-h] [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]
                    [-w INTERVAL] [-W TIME] [-i ITERATIONS] [-m] [-u] [-p] [-c] [-t]
                    [-P] [-e] [-k] [-f] [-C] [-o] [-l] [-x] [-E] [--cpu-power-metrics]
                    [--cpu-prochot] [--cpu-freq-metrics] [--cpu-c0-res]
                    [--cpu-lclk-dpm-level NBIODID] [--cpu-pwr-svi-telemetry-rails]
                    [--cpu-io-bandwidth IO_BW LINKID_NAME]
                    [--cpu-xgmi-bandwidth XGMI_BW LINKID_NAME] [--cpu-metrics-ver]
                    [--cpu-metrics-table] [--cpu-socket-energy] [--cpu-ddr-bandwidth]
                    [--cpu-temp] [--cpu-dimm-temp-range-rate DIMM_ADDR]
                    [--cpu-dimm-pow-consumption DIMM_ADDR]
                    [--cpu-dimm-thermal-sensor DIMM_ADDR] [--core-boost-limit]

```

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```

[--core-curr-active-freq-core-limit] [--core-energy]
[--json | --csv] [--file FILE] [--loglevel LEVEL]

```

If no GPU is specified, returns metric information for all GPUs on the system.
 If no metric argument is provided, all metric information will be displayed.

Metric arguments:

```

-h, --help          show this help message and exit
-m, --mem-usage     Memory usage per block
-u, --usage         Displays engine usage information
-p, --power         Current power usage
-c, --clock         Average, max, and current clock frequencies
-t, --temperature  Current temperatures
-P, --pcie          Current PCIe speed, width, and replay count
-e, --ecc           Total number of ECC errors
-k, --ecc-blocks   Number of ECC errors per block
-V, --voltage       GPU voltage
-f, --fan           Current fan speed
-C, --voltage-curve Display voltage curve
-o, --overdrive     Current GFX and MEM clock overdrive level
-l, --perf-level    Current DPM performance level
-x, --xgmi-err      XGMI error information since last read
-E, --energy        Amount of energy consumed
-v, --violation     Displays throttle accumulators;
                    Only available for MI300 or newer ASICs

```

Watch Arguments:

```

-w, --watch INTERVAL      Reprint the command in a loop of INTERVAL seconds
-W, --watch_time TIME     The total duration of TIME to watch the command
-i, --iterations ITERATIONS The total number of ITERATIONS to repeat the command

```

CPU Arguments:

```

--cpu-power-metrics          CPU power metrics
--cpu-prochot                Displays prochot status
--cpu-freq-metrics           Displays currentFclkMemclk frequencies and
↪ cclk frequency limit
--cpu-c0-res                 Displays C0 residency
--cpu-lclk-dpm-level NBIOD   Displays lclk dpm level range. Requires
↪ socket ID and NBOID as inputs
--cpu-pwr-svi-telemetry-rails Displays svi based telemetry for all rails
--cpu-io-bandwidth IO_BW LINKID_NAME Displays current IO bandwidth for the
↪ selected CPU.
                               input parameters are bandwidth type(1) and
↪ link ID encodings
                               i.e. P2, P3, G0 - G7
--cpu-xgmi-bandwidth XGMI_BW LINKID_NAME Displays current XGMI bandwidth for the
↪ selected CPU
                               input parameters are bandwidth type(1,2,4)
↪ and link ID encodings
                               i.e. P2, P3, G0 - G7
--cpu-metrics-ver           Displays metrics table version
--cpu-metrics-table         Displays metric table

```

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<code>--cpu-socket-energy</code>	Displays socket energy for the selected CPU.
<code>↪socket</code>	
<code>--cpu-ddr-bandwidth</code>	Displays per socket max ddr bw, current.
<code>↪utilized bw,</code>	
	and current utilized ddr bw in percentage
<code>--cpu-temp</code>	Displays cpu socket temperature
<code>--cpu-dimm-temp-range-rate DIMM_ADDR</code>	Displays dimm temperature range and refresh.
<code>↪rate</code>	
<code>--cpu-dimm-pow-consumption DIMM_ADDR</code>	Displays dimm power consumption
<code>--cpu-dimm-thermal-sensor DIMM_ADDR</code>	Displays dimm thermal sensor
CPU Core Arguments:	
<code>--core-boost-limit</code>	Get boost limit for the selected cores
<code>--core-curr-active-freq-core-limit</code>	Get Current CCLK limit set per Core
<code>--core-energy</code>	Displays core energy for the selected core
Device Arguments:	
<code>-g, --gpu GPU [GPU ...]</code>	Select a GPU ID, BDF, or UUID from the possible choices:
<code>↪XXXXXXXXXXXX</code>	ID: 0 BDF: 0000:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
<code>↪XXXXXXXXXXXX</code>	ID: 1 BDF: 0001:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
<code>↪XXXXXXXXXXXX</code>	ID: 2 BDF: 0002:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
<code>↪XXXXXXXXXXXX</code>	ID: 3 BDF: 0003:01:00.0 UUID: XXXXXXXX-XXXX-XXXX-XXXX-
	all Selects all devices
<code>-U, --cpu CPU [CPU ...]</code>	Select a CPU ID from the possible choices:
	ID: 0
	ID: 1
	ID: 2
	ID: 3
	all Selects all devices
<code>-O, --core CORE [CORE ...]</code>	Select a Core ID from the possible choices:
	ID: 0 - 95
	all Selects all devices
Command Modifiers:	
<code>--json</code>	Displays output in JSON format (human
<code>↪readable by default).</code>	
<code>--csv</code>	Displays output in CSV format (human
<code>↪readable by default).</code>	
<code>--file FILE</code>	Saves output into a file on the provided
<code>↪path (stdout by default).</code>	
<code>--loglevel LEVEL</code>	Set the logging level from the possible
<code>↪choices:</code>	
	DEBUG, INFO, WARNING, ERROR, CRITICAL

6.3.6 amd-smi process

Lists general process information running on the specified GPU.

```
~$ amd-smi process --help
usage: amd-smi process [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                    [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]
                    [-w INTERVAL] [-W TIME] [-i ITERATIONS] [-G] [-e] [-p PID]
                    [-n NAME]
```

If no GPU is specified, returns information for all GPUs on the system.

If no process argument is provided, all process information will be displayed.

Process arguments:

Process arguments:

```
-h, --help                show this help message and exit
-G, --general             pid, process name, memory usage
-e, --engine              All engine usages
-p, --pid PID            Gets all process information about the specified process.
↳based on Process ID
-n, --name NAME          Gets all process information about the specified process.
↳based on Process Name.
                          If multiple processes have the same name, information is
↳returned for all of them.
```

Watch Arguments:

```
-w, --watch INTERVAL     Reprint the command in a loop of INTERVAL seconds
-W, --watch_time TIME    The total duration of TIME to watch the command
-i, --iterations ITERATIONS The total number of ITERATIONS to repeat the command
```

Device Arguments:

```
-g, --gpu GPU [GPU ...]  Select a GPU ID, BDF, or UUID from the possible choices:
↳XXXXXXXXXXXXXXXXX      ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳XXXXXXXXXXXXXXXXX      ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳XXXXXXXXXXXXXXXXX      ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↳XXXXXXXXXXXXXXXXX      ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                          all | Selects all devices
-U, --cpu CPU [CPU ...]  Select a CPU ID from the possible choices:
                          ID: 0
                          ID: 1
                          ID: 2
                          ID: 3
                          all | Selects all devices
-O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                          ID: 0 - 95
                          all | Selects all devices
```

Command Modifiers:

```
--json                    Displays output in JSON format (human readable by
↳default).
```

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```

--csv           Displays output in CSV format (human readable by default).
--file FILE     Saves output into a file on the provided path (stdout by
↪default).
--loglevel LEVEL Set the logging level from the possible choices:
                DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.7 amd-smi event

Displays event information for the given GPU.

```

~$ amd-smi event --help
usage: amd-smi event [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                  [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]

If no GPU is specified, returns event information for all GPUs on the system.

Event Arguments:
  -h, --help           show this help message and exit

Device Arguments:
  -g, --gpu GPU [GPU ...] Select a GPU ID, BDF, or UUID from the possible choices:
↪XXXXXXXXXXXXX          ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          all | Selects all devices
  -U, --cpu CPU [CPU ...] Select a CPU ID from the possible choices:
                          ID: 0
                          ID: 1
                          ID: 2
                          ID: 3
                          all | Selects all devices
  -O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                              ID: 0 - 95
                              all | Selects all devices

Command Modifiers:
  --json           Displays output in JSON format (human readable by default).
  --csv           Displays output in CSV format (human readable by default).
  --file FILE     Saves output into a file on the provided path (stdout by
↪default).
  --loglevel LEVEL Set the logging level from the possible choices:
                  DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.8 amd-smi topology

Displays topology information of the specified devices.

```
~$ amd-smi topology --help
usage: amd-smi topology [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                        [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]] [-a]
                        [-w] [-o] [-t] [-b]
```

If no GPU is specified, returns information for all GPUs on the system.

If no topology argument is provided, all topology information will be displayed.

Topology arguments:

```
-h, --help                show this help message and exit
-a, --access              Displays link accessibility between GPUs
-w, --weight              Displays relative weight between GPUs
-o, --hops                Displays the number of hops between GPUs
-t, --link-type           Displays the link type between GPUs
-b, --numa-bw             Display max and min bandwidth between nodes
-c, --coherent            Display cache coherent (or non-coherent) link capability
↪between nodes
-n, --atomics             Display 32 and 64-bit atomic io link capability between nodes
-d, --dma                 Display P2P direct memory access (DMA) link capability
↪between nodes
-z, --bi-dir              Display P2P bi-directional link capability between nodes
```

Device Arguments:

```
-g, --gpu GPU [GPU ...]  Select a GPU ID, BDF, or UUID from the possible choices:
↪XXXXXXXXXXXXX          ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX          all | Selects all devices
-U, --cpu CPU [CPU ...]  Select a CPU ID from the possible choices:
                           ID: 0
                           ID: 1
                           ID: 2
                           ID: 3
                           all | Selects all devices
-O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                           ID: 0 - 95
                           all | Selects all devices
```

Command Modifiers:

```
--json                    Displays output in JSON format (human readable by default).
--csv                     Displays output in CSV format (human readable by default).
--file FILE               Saves output into a file on the provided path (stdout by
↪default).
--loglevel LEVEL          Set the logging level from the possible choices:
                           DEBUG, INFO, WARNING, ERROR, CRITICAL
```

6.3.9 amd-smi set

Set options for specified devices.

```
~$ amd-smi set --help
usage: amd-smi set [-h] (-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]) [-f %]
                  [-l LEVEL] [-P SETPROFILE] [-d SCLKMAX] [-C PARTITION] [-M PARTITION]
                  [-o WATTS] [-p POLICY_ID] [-x POLICY_ID] [-R STATUS]
                  [--cpu-pwr-limit PWR_LIMIT] [--cpu-xgmi-link-width MIN_WIDTH MAX_
↪WIDTH]
                  [--cpu-lclk-dpm-level NBIOD MIN_DPM MAX_DPM] [--cpu-pwr-eff-mode_
↪MODE]
                  [--cpu-gmi3-link-width MIN_LW MAX_LW] [--cpu-pcie-link-rate LINK_RATE]
                  [--cpu-df-pstate-range MAX_PSTATE MIN_PSTATE] [--cpu-enable-apb]
                  [--cpu-disable-apb DF_PSTATE] [--soc-boost-limit BOOST_LIMIT]
                  [--core-boost-limit BOOST_LIMIT] [--json | --csv] [--file FILE]
                  [--loglevel LEVEL]
```

If no GPU is specified, will select all GPUs on the system.

A set argument must be provided; Multiple set arguments are accepted.

Requires 'sudo' privileges.

Set Arguments:

```
-h, --help                show this help message and exit
-f, --fan %               Set GPU fan speed (0-255 or 0-100%)
-l, --perf-level LEVEL   Set one of the following performance_
↪levels:
                           AUTO, LOW, HIGH, MANUAL, STABLE_STD,
↪STABLE_PEAK, STABLE_MIN_MCLK, STABLE_MIN_SCLK, DETERMINISM
-P, --profile PROFILE_LEVEL Set power profile level (#) or choose one_
↪of available profiles:
                           CUSTOM_MASK, VIDEO_MASK, POWER_SAVING_
↪MASK, COMPUTE_MASK, VR_MASK, THREE_D_FULL_SCR_MASK, BOOTUP_DEFAULT
-d, --perf-determinism SCLKMAX Set performance determinism and select one_
↪of the corresponding performance levels:
                           AUTO, LOW, HIGH, MANUAL, STABLE_STD,
↪STABLE_PEAK, STABLE_MIN_MCLK, STABLE_MIN_SCLK, DETERMINISM
-C, --compute-partition TYPE/INDEX Set one of the following the accelerator_
↪TYPE or profile INDEX:
                           N/A.
                           Use `sudo amd-smi partition --
↪accelerator` to find acceptable values.
-M, --memory-partition PARTITION Set one of the following the memory_
↪partition modes:
                           NPS1, NPS2, NPS4, NPS8
-o, --power-cap WATTS      Set power capacity limit:
                           min cap: 0 W, max cap: 550 W
-p, --soc-pstate POLICY_ID Set the GPU soc pstate policy using policy_
↪id, an integer. Valid id's include:
                           N/A
-x, --xgmi-plpd POLICY_ID Set the GPU XGMI per-link power down_
↪policy using policy id, an integer. Valid id's include:
                           N/A
-c, --clk-level CLK_TYPE [FREQ_LEVELS ...] Set one or more sclk (aka gfxclk), mclk,
↪
```

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```

↪fclk, pcie, or socclk frequency levels.
                                Use `amd-smi static --clock` to find
↪acceptable levels.
-L, --clk-limit CLK_TYPE LIM_TYPE VALUE   Sets the sclk (aka gfxclk) or mclk minimum
↪and maximum frequencies.
                                ex: amd-smi set -L (sclk | mclk) (min |
↪max) value
-R, --process-isolation STATUS             Enable or disable the GPU process
↪isolation on a per partition basis: 0 for disable and 1 for enable.

CPU Arguments:
--cpu-pwr-limit PWR_LIMIT                 Set power limit for the
↪given socket. Input parameter is power limit value.
--cpu-xgmi-link-width MIN_WIDTH MAX_WIDTH   Set max and Min
↪linkwidth. Input parameters are min and max link width values
--cpu-lclk-dpm-level NBIOID MIN_DPM MAX_DPM Sets the max and min
↪dpm level on a given NBIO.
                                Input parameters are
↪die_index, min dpm, max dpm.
--cpu-pwr-eff-mode MODE                   Sets the power
↪efficiency mode policy. Input parameter is mode.
--cpu-gmi3-link-width MIN_LW MAX_LW       Sets max and min gmi3
↪link width range
--cpu-pcie-link-rate LINK_RATE            Sets pcie link rate
--cpu-df-pstate-range MAX_PSTATE MIN_PSTATE Sets max and min df-
↪pstates
--cpu-enable-apb                           Enables the DF p-state
↪performance boost algorithm
--cpu-disable-apb DF_PSTATE               Disables the DF p-state
↪performance boost algorithm. Input parameter is DFPstate (0-3)
--soc-boost-limit BOOST_LIMIT             Sets the boost limit
↪for the given socket. Input parameter is socket BOOST_LIMIT value

CPU Core Arguments:
--core-boost-limit BOOST_LIMIT            Sets the boost limit
↪for the given core. Input parameter is core BOOST_LIMIT value

Device Arguments:
-g, --gpu GPU [GPU ...]                   Select a GPU ID, BDF, or UUID from the
↪possible choices:
                                ID: 0 | BDF: 0000:01:00.0 | UUID:
↪XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
                                ID: 1 | BDF: 0001:01:00.0 | UUID:
↪XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
                                ID: 2 | BDF: 0002:01:00.0 | UUID:
↪XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
                                ID: 3 | BDF: 0003:01:00.0 | UUID:
↪XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
                                all | Selects all devices
-U, --cpu CPU [CPU ...]                   Select a CPU ID from
↪the possible choices:
                                ID: 0

```

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```

ID: 1
ID: 2
ID: 3
    all | Selects all.
↪ devices
  -0, --core CORE [CORE ...]
↪ the possible choices:
ID: 0 - 95
    all | Selects all.
↪ devices

Command Modifiers:
  --json
↪ format (human readable by default).
  --csv
↪ format (human readable by default).
  --file FILE
↪ file on the provided path (stdout by default).
  --loglevel LEVEL
↪ from the possible choices:
                                DEBUG, INFO,
↪ WARNING, ERROR, CRITICAL

```

6.3.10 amd-smi reset

Reset options for specified devices.

```

~$ amd-smi reset --help
usage: amd-smi reset [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                   (-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]) [-G] [-C]
                   [-f] [-p] [-x] [-d] [-C] [-M] [-o] [-l]

If no GPU is specified, will select all GPUs on the system.
A reset argument must be provided; Multiple reset arguments are accepted.
Requires 'sudo' privileges.

Reset Arguments:
  -h, --help           show this help message and exit
  -G, --gpureset      Reset the specified GPU
  -c, --clocks        Reset clocks and overdrive to default
  -f, --fans          Reset fans to automatic (driver) control
  -p, --profile       Reset power profile back to default
  -x, --xgmierr       Reset XGMI error counts
  -d, --perf-determinism
                    Disable performance determinism
  -o, --power-cap     Reset power capacity limit to max capable
  -l, --clean-local-data
                    Clean up local data in LDS/GPRs on a per partition basis

Device Arguments:
  -g, --gpu GPU [GPU ...]
                    Select a GPU ID, BDF, or UUID from the possible choices:
                    ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪ XXXXXXXXXXXXXXXX
                    ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-

```

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```

↪XXXXXXXXXXXXX
                                ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                all | Selects all devices
-U, --cpu CPU [CPU ...]       Select a CPU ID from the possible choices:
                                ID: 0
                                ID: 1
                                ID: 2
                                ID: 3
                                all | Selects all devices
-O, --core CORE [CORE ...]   Select a Core ID from the possible choices:
                                ID: 0 - 95
                                all | Selects all devices

Command Modifiers:
--json                         Displays output in JSON format (human readable by default).
--csv                          Displays output in CSV format (human readable by default).
--file FILE                     Saves output into a file on the provided path (stdout by ↪
↪default).
--loglevel LEVEL               Set the logging level from the possible choices:
                                DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.11 amd-smi monitor

Monitor metrics for target devices.

```

~$ amd-smi monitor --help
usage: amd-smi monitor [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                       [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]
                       [-w INTERVAL] [-W TIME] [-i ITERATIONS] [-p] [-t] [-u] [-m] [-n]
                       [-d] [-e] [-v] [-r] [-q]

```

Monitor a target device for the specified arguments.
 If no arguments are provided, all arguments will be enabled.
 Use the watch arguments to run continuously.

```

Monitor Arguments:
-h, --help                 show this help message and exit
-p, --power-usage          Monitor power usage and power cap in Watts
-t, --temperature         Monitor temperature in Celsius
-u, --gfx                  Monitor graphics utilization (%) and clock (MHz)
-m, --mem                  Monitor memory utilization (%) and clock (MHz)
-n, --encoder              Monitor encoder utilization (%) and clock (MHz)
-d, --decoder              Monitor decoder utilization (%) and clock (MHz)
-e, --ecc                  Monitor ECC single bit, ECC double bit, and PCIe replay ↪
↪error counts
-v, --vram-usage           Monitor memory usage in MB
-r, --pcie                 Monitor PCIe bandwidth in Mb/s
-q, --process              Enable Process information table below monitor output
-V, --violation            Monitor power and thermal violation status (%);

```

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Only available for MI300 or newer ASICs

Watch Arguments:

```
-w, --watch INTERVAL      Reprint the command in a loop of INTERVAL seconds
-W, --watch_time TIME     The total duration of TIME to watch the command
-i, --iterations ITERATIONS The total number of ITERATIONS to repeat the command
```

Device Arguments:

```
-g, --gpu GPU [GPU ...]  Select a GPU ID, BDF, or UUID from the possible choices:
                           ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                           ↪XXXXXXXXXXXXX
                           all | Selects all devices
-U, --cpu CPU [CPU ...]  Select a CPU ID from the possible choices:
                           ID: 0
                           ID: 1
                           ID: 2
                           ID: 3
                           all | Selects all devices
-O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                           ID: 0 - 95
                           all | Selects all devices
```

Command Modifiers:

```
--json                    Displays output in JSON format (human readable by ↪
                           ↪default).
--csv                     Displays output in CSV format (human readable by default).
--file FILE               Saves output into a file on the provided path (stdout by ↪
                           ↪default).
--loglevel LEVEL         Set the logging level from the possible choices:
                           DEBUG, INFO, WARNING, ERROR, CRITICAL
```

6.3.12 amd-smi xgmi

Displays XGMI information of specified devices.

```
~$ amd-smi xgmi --help
usage: amd-smi xgmi [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                  [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]] [-m]
```

If no GPU is specified, returns information for all GPUs on the system.
If no xgmi argument is provided, all xgmi information will be displayed.

XGMI arguments:

```
-h, --help                show this help message and exit
-m, --metric              Metric XGMI information
-l, --link-status         XGMI Link Status information
```

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```

Device Arguments:
  -g, --gpu GPU [GPU ...]   Select a GPU ID, BDF, or UUID from the possible choices:
                             ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                             ↪XXXXXXXXXXXXX
                             ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                             ↪XXXXXXXXXXXXX
                             ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                             ↪XXXXXXXXXXXXX
                             ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                             ↪XXXXXXXXXXXXX
                             all | Selects all devices
  -U, --cpu CPU [CPU ...]   Select a CPU ID from the possible choices:
                             ID: 0
                             ID: 1
                             ID: 2
                             ID: 3
                             all | Selects all devices
  -O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                             ID: 0 - 95
                             all | Selects all devices

Command Modifiers:
  --json                     Displays output in JSON format (human readable by default).
  --csv                      Displays output in CSV format (human readable by default).
  --file FILE                Saves output into a file on the provided path (stdout by
  ↪default).
  --loglevel LEVEL          Set the logging level from the possible choices:
                             DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.3.13 amd-smi partition

Displays partition information of the devices.

```

~$ amd-smi partition --help
usage: amd-smi partition [-h] [-g GPU [GPU ...]] [-c] [-m] [-a] [--json | --csv]
                        [--file FILE] [--loglevel LEVEL]

If no GPU is specified, returns information for all GPUs on the system.
If no partition argument is provided, all partition information will be displayed.

Partition arguments:
  -h, --help                show this help message and exit
  -c, --current              display the current partition information
  -m, --memory               display the current memory partition mode and capabilities
  -a, --accelerator          display accelerator partition information

Device Arguments:
  -g, --gpu GPU [GPU ...]   Select a GPU ID, BDF, or UUID from the possible choices:
                             ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
                             ↪XXXXXXXXXXXXX
                             ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-

```

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```

↪XXXXXXXXXXXXX
                                ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                all | Selects all devices

Command Modifiers:
--json                          Displays output in JSON format (human readable by default).
--csv                            Displays output in CSV format (human readable by default).
--file FILE                      Saves output into a file on the provided path (stdout by ↪
↪default).
--loglevel LEVEL                 Set the logging level from the possible choices:

```

6.3.14 amd-smi ras

Displays RAS information of specified devices.

```

~$ amd-smi ras --help
usage: amd-smi ras [-h] --cper [--severity SEVERITY [SEVERITY ...]] [--folder FOLDER]
                  [--file-limit FILE_LIMIT] [--follow]
                  [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]
                  [--json | --csv] [--file FILE] [--loglevel LEVEL]

Retrieve and decode RAS (CPER) entries from the kernel driver.
Supports filtering by severity, exporting to different formats, and continuous ↪
↪monitoring.
This command accepts options only; no positional arguments are required.

RAS arguments:
-h, --help                      show this help message and exit
--cper                          Trigger CPER data retrieval
--afid                          Generate an AFID (AMD Field ID) given a CPER ↪
↪record file.
--severity SEVERITY [SEVERITY ...] Set the SEVERITY filters from the following:
                                nonfatal-uncorrected, fatal, nonfatal-
↪corrected, all
--folder FOLDER                 Folder to dump CPER report files
--file-limit FILE_LIMIT         Maximum number of entries per output file
--cper-file CPER_FILE           Full path of the CPER record file to generate the ↪
↪AFID
--follow                        Continuously monitor for new entries

Device Arguments:
-g, --gpu GPU [GPU ...]        Select a GPU ID, BDF, or UUID from the possible choices:
                                ID: 0 | BDF: 0000:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                ID: 1 | BDF: 0001:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                ID: 2 | BDF: 0002:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-
↪XXXXXXXXXXXXX
                                ID: 3 | BDF: 0003:01:00.0 | UUID: XXXXXXXX-XXXX-XXXX-XXXX-

```

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```

↪XXXXXXXXXXXXX
                all | Selects all devices
-U, --cpu CPU [CPU ...] Select a CPU ID from the possible choices:
                        ID: 0
                        ID: 1
                        ID: 2
                        ID: 3
                all | Selects all devices
-O, --core CORE [CORE ...] Select a Core ID from the possible choices:
                        ID: 0 - 95
                all | Selects all devices

Command Modifiers:
--json           Displays output in JSON format (human readable by default).
--csv           Displays output in CSV format (human readable by default).
--file FILE     Saves output into a file on the provided path (stdout by ↪
↪default).
--loglevel LEVEL Set the logging level from the possible choices:
                DEBUG, INFO, WARNING, ERROR, CRITICAL

```

6.4 Interpreting the output

When you run an `amd-smi` command, the tool presents detailed information across various categories, each containing specific fields and their current values.

6.4.1 About N/A values

N/A typically indicates that the data for a specific field is either unavailable or irrelevant in the current context for your device and its software environment. The exact reason may vary depending on the field and the GPU. In general, you can interpret N/A to mean one of the following:

Not Applicable: The feature or parameter does not apply to your specific AMD hardware or its current configuration. Examples include display-related clocks on a headless compute card and partition details when the GPU is not partitioned.

Not Available: The information cannot be retrieved by the `amd-smi` tool at this time. This could be due to one of the following reasons:

- The hardware component does not report the specific metric.
- The currently installed `amdgpu` driver version does not support querying this particular piece of information through `amd-smi-lib`.

6.4.2 Example output from `amd-smi static`

The following block is example output from the `amd-smi static` command without additional modifiers.

```

~$ amd-smi static
CPU: 0
SMU:
    FW_VERSION: 85.90.0
    INTERFACE_VERSION:
    PROTO VERSION: 6

```

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```
...
GPU: 0
  ASIC:
    MARKET_NAME: AMD Instinct MI300A
    VENDOR_ID: 0x1002
    VENDOR_NAME: Advanced Micro Devices Inc. [AMD/ATI]
    SUBVENDOR_ID: 0x1002
    DEVICE_ID: 0x74a0
    SUBSYSTEM_ID: 0x74a0
    REV_ID: 0x00
    ASIC_SERIAL: 0XXXXXXXXXXXXXXXXX
    OAM_ID: 0
    NUM_COMPUTE_UNITS: 228
    TARGET_GRAPHICS_VERSION: gfx942
  BUS:
    BDF: 0000:01:00.0
    MAX_PCIE_WIDTH: 16
    MAX_PCIE_SPEED: 32 GT/s
    PCIE_INTERFACE_VERSION: Gen 5
    SLOT_TYPE: PCIE
  VBIOS:
    NAME: N/A
    BUILD_DATE: N/A
    PART_NUMBER: N/A
    VERSION: N/A
  LIMIT:
    MAX_POWER: 550 W
    MIN_POWER: 0 W
    SOCKET_POWER: 550 W
    SLOWDOWN_EDGE_TEMPERATURE: N/A
    SLOWDOWN_HOTSPOT_TEMPERATURE: 100 °C
    SLOWDOWN_VRAM_TEMPERATURE: 105 °C
    SHUTDOWN_EDGE_TEMPERATURE: N/A
    SHUTDOWN_HOTSPOT_TEMPERATURE: 110 °C
    SHUTDOWN_VRAM_TEMPERATURE: 115 °C
  DRIVER:
    NAME: amdgpu
    VERSION: 6.14.4
  BOARD:
    MODEL_NUMBER: N/A
    PRODUCT_SERIAL: N/A
    FRU_ID: N/A
    PRODUCT_NAME: Aqua Vanjaram [Instinct MI300A]
    MANUFACTURER_NAME: Advanced Micro Devices, Inc. [AMD/ATI]
  RAS:
    EEPROM_VERSION: 0x30000
    BAD_PAGE_THRESHOLD: N/A
    PARITY_SCHEMA: DISABLED
    SINGLE_BIT_SCHEMA: DISABLED
    DOUBLE_BIT_SCHEMA: DISABLED
    POISON_SCHEMA: ENABLED
```

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```

ECC_BLOCK_STATE:
  UMC: DISABLED
  SDMA: ENABLED
  GFX: ENABLED
  MMHUB: ENABLED
  ATHUB: DISABLED
  PCIE_BIF: DISABLED
  HDP: DISABLED
  XGMI_WAFL: DISABLED
  DF: DISABLED
  SMN: DISABLED
  SEM: DISABLED
  MP0: DISABLED
  MP1: DISABLED
  FUSE: DISABLED
  MCA: DISABLED
  VCN: DISABLED
  JPEG: DISABLED
  IH: DISABLED
  MPIO: DISABLED
PARTITION:
  ACCELERATOR_PARTITION: SPX
  MEMORY_PARTITION: NPS1
  PARTITION_ID: 0
SOC_PSTATE: N/A
XGMI_PLPD: N/A
PROCESS_ISOLATION: Disabled
NUMA:
  NODE: 0
  AFFINITY: 0
  CPU AFFINITY:
    0xffffffff
    0xffffffff00000000
    0x0
  SOCKET AFFINITY:
    0
VRAM:
  TYPE: HBM
  VENDOR: UNKNOWN
  SIZE: 96432 MB
  BIT_WIDTH: 8192
  MAX_BANDWIDTH: 5325 GB/s
CACHE_INFO:
  CACHE_0:
    CACHE_PROPERTIES: DATA_CACHE, SIMD_CACHE
    CACHE_SIZE: 32 KB
    CACHE_LEVEL: 1
    MAX_NUM_CU_SHARED: 1
    NUM_CACHE_INSTANCE: 228
  CACHE_1:
    CACHE_PROPERTIES: INST_CACHE, SIMD_CACHE
    CACHE_SIZE: 64 KB

```

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```
    CACHE_LEVEL: 1
    MAX_NUM_CU_SHARED: 2
    NUM_CACHE_INSTANCE: 108
CACHE_2:
    CACHE_PROPERTIES: INST_CACHE, SIMD_CACHE
    CACHE_SIZE: 64 KB
    CACHE_LEVEL: 1
    MAX_NUM_CU_SHARED: 1
    NUM_CACHE_INSTANCE: 12
CACHE_3:
    CACHE_PROPERTIES: DATA_CACHE, SIMD_CACHE
    CACHE_SIZE: 16 KB
    CACHE_LEVEL: 1
    MAX_NUM_CU_SHARED: 2
    NUM_CACHE_INSTANCE: 108
CACHE_4:
    CACHE_PROPERTIES: DATA_CACHE, SIMD_CACHE
    CACHE_SIZE: 16 KB
    CACHE_LEVEL: 1
    MAX_NUM_CU_SHARED: 1
    NUM_CACHE_INSTANCE: 12
CACHE_5:
    CACHE_PROPERTIES: DATA_CACHE, SIMD_CACHE
    CACHE_SIZE: 4096 KB
    CACHE_LEVEL: 2
    MAX_NUM_CU_SHARED: 228
    NUM_CACHE_INSTANCE: 1
CACHE_6:
    CACHE_PROPERTIES: DATA_CACHE, SIMD_CACHE
    CACHE_SIZE: 262144 KB
    CACHE_LEVEL: 3
    MAX_NUM_CU_SHARED: 228
    NUM_CACHE_INSTANCE: 1
CLOCK:
  SYS:
    CURRENT_LEVEL: 1
    FREQUENCY_LEVELS:
      LEVEL 0: 500 MHz
      LEVEL 1: 207 MHz
      LEVEL 2: 2100 MHz
  MEM:
    CURRENT_LEVEL: 3
    FREQUENCY_LEVELS:
      LEVEL 0: 900 MHz
      LEVEL 1: 1100 MHz
      LEVEL 2: 1200 MHz
      LEVEL 3: 1300 MHz
  DF:
    CURRENT_LEVEL: 3
    FREQUENCY_LEVELS:
      LEVEL 0: 1200 MHz
      LEVEL 1: 1600 MHz
```

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```

                LEVEL 2: 1900 MHz
                LEVEL 3: 2000 MHz
SOC:
  CURRENT LEVEL: 0
  FREQUENCY_LEVELS:
    LEVEL 0: 43 MHz
    LEVEL 1: 800 MHz
    LEVEL 2: 1000 MHz
    LEVEL 3: 1143 MHz
DCEF: N/A
VCLK0:
  CURRENT LEVEL: 0
  FREQUENCY_LEVELS:
    LEVEL 0: 54 MHz
VCLK1:
  CURRENT LEVEL: 0
  FREQUENCY_LEVELS:
    LEVEL 0: 54 MHz
DCLK0:
  CURRENT LEVEL: 0
  FREQUENCY_LEVELS:
    LEVEL 0: 45 MHz
DCLK1:
  CURRENT LEVEL: 0
  FREQUENCY_LEVELS:
    LEVEL 0: 45 MHz
...

```

6.4.3 Listing CPER entries using amd-smi

This example code shows how to list CPER entries for all GPUs into files

```

~$ sudo amd-smi ras --cper --severity all --folder /tmp/cper_dump/
timestamp      gpu_id severity      file_name      list of afids
2000/06/27 10:45:13 0      FATAL         fatal-1.cper   30
2000/06/27 10:45:13 1      FATAL         fatal-2.cper   30
2000/06/27 10:45:13 2      FATAL         fatal-3.cper   30
2000/06/27 10:45:13 3      FATAL         fatal-4.cper   30
2000/06/27 10:45:13 4      FATAL         fatal-5.cper   30
2000/06/27 10:45:13 5      FATAL         fatal-6.cper   30
2000/06/27 10:45:13 6      FATAL         fatal-7.cper   30
2000/06/27 10:45:13 7      FATAL         fatal-8.cper   30

```

This example code shows how to list CPER entries for a given GPU into files

```

~$ sudo amd-smi ras --cper --severity all --folder /tmp/cper_dump/ --gpu 1
timestamp      gpu_id severity      file_name      list of afids
2000/06/27 10:45:13 1      FATAL         fatal-1.cper   30

```

This example code shows how to list CPER entries and their JSON data for a given GPU into files

```

~$ sudo amd-smi ras --cper --severity all --folder /tmp/cper_dump/ --gpu 1 --json

```

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```

timestamp          gpu_id severity          file_name          list of afids
2000/06/27 10:45:13 1          FATAL             fatal-1.cper       30
~$ ls -alh /tmp/cper_dump/
total 12K
drwxr-xr-x 2 root root 46 Sep 16 21:12 .
drwxrwxrwt 1 root root 4.0K Sep 16 18:03 ..
-rw-r--r-- 1 root root 376 Sep 16 21:12 fatal-1.cper
-rw-r--r-- 1 root root 347 Sep 16 21:12 fatal-1.json
~$ cat /tmp/cper_dump/fatal-1.json
{
  "error_severity": "fatal",
  "notify_type": "MCE",
  "timestamp": "2000/06/27 10:45:13",
  "signature": "CPER",
  "revision": 256,
  "signature_end": "0xffffffff",
  "sec_cnt": 1,
  "record_length": 376,
  "platform_id": "111102-G40307-0C",
  "creator_id": "136c692517001839",
  "record_id": "f0000031",
  "flags": 0,
  "persistence_info": 0
}

```

This example code shows how to continuously list CPER entries without exiting

```

~$ sudo amd-smi ras --cper --follow --severity all --folder /tmp/cper_dump
Press CTRL + C to stop.
timestamp          gpu_id severity          file_name          list of afids
2000/06/27 10:45:13 0          FATAL             fatal-1.cper       30
2000/06/27 10:45:13 1          FATAL             fatal-2.cper       30
2000/06/27 10:45:13 2          FATAL             fatal-3.cper       30
2000/06/27 10:45:13 3          FATAL             fatal-4.cper       30
2000/06/27 10:45:13 4          FATAL             fatal-5.cper       30
2000/06/27 10:45:13 5          FATAL             fatal-6.cper       30
2000/06/27 10:45:13 6          FATAL             fatal-7.cper       30
2000/06/27 10:45:13 7          FATAL             fatal-8.cper       30
...

```

This example code shows how to list CPER entries with a limited number of entries

```

~$ sudo amd-smi ras --cper --severity all --folder /tmp/cper_dump --file-limit 5
timestamp          gpu_id severity          file_name          list of afids
2000/06/27 10:45:13 0          FATAL             fatal-1.cper       30
2000/06/27 10:45:13 1          FATAL             fatal-2.cper       30
2000/06/27 10:45:13 2          FATAL             fatal-3.cper       30
2000/06/27 10:45:13 3          FATAL             fatal-4.cper       30
2000/06/27 10:45:13 4          FATAL             fatal-5.cper       30

```

This example code shows how to list a specific severity of CPER entries only

```
~$ sudo amd-smi ras --cper --severity fatal --folder /tmp/cper_dump/  
timestamp          gpu_id  severity          file_name          list of afids  
2000/06/27 10:45:13  0        FATAL             fatal-1.cper       30
```

This example code shows how to dump AFID errors in a CPER file

```
~$ sudo amd-smi ras --afid --cper-file /tmp/cper_dump/fatal-1.cper
```

Refer to `amd_smi_cper_example.py` & `amd_smi_afid_example.py` for API examples

USING AMD SMI IN A DOCKER CONTAINER

To ensure proper functionality of AMD SMI within a Docker container, the following configuration options must be included. These settings are particularly important for managing memory partitions, as partitioning depends on loading and unloading drivers (with `systemd` dependencies):

- `--cap-add=SYS_MODULE`

This option adds the `SYS_MODULE` capability to the container, allowing it to load and interact with kernel modules.

Note

Granting `SYS_MODULE` increases the container's privileges and reduces isolation from the host. Use this option only with trusted containers and images.

- `-v /lib/modules:/lib/modules`

By mounting the `/lib/modules/` directory into the container, the container gains access to the host's kernel modules, allowing it to load and interact with them. Without this access, operations requiring module loading like memory partitioning would fail.

For example:

```
> docker run --rm -it --network=host --ipc=host --device=/dev/kfd --device=/dev/dri/ --group-add video --cap-add=SYS_PTRACE --cap-add=SYS_MODULE --security-opt seccomp=unconfined -v $PWD:/long_pathname_so_that_rpms_can_package_the_debug_info/src -v $HOME/.ccache:$HOME/.ccache -v /etc/passwd:/etc/passwd -v /lib/modules:/lib/modules -v /etc/group:/etc/group -u root:$(id -g) $(jenkins-utils/scripts/find_reference_repo.sh -v) -w /long_pathname_so_that_rpms_can_package_the_debug_info/src compute-artifactory.amd.com:5000/rocm-plus-docker/centos-7.7-bld:latest bash
bash-4.2# sudo lsmod|grep amdgpu
amdgpu                15417344  0
amddrm_ttm_helper     16384    1 amdgpu
amdttm                90112    2 amdgpu,amddrm_ttm_helper
amdxcpc               16384    1 amdgpu
amddrm_buddy          20480    1 amdgpu
amd_sched             53248    1 amdgpu
amd_kcl               49152    3 amd_sched,amdttm,amdgpu
drm_kms_helper        307200   4 amdgpu
drm                   618496   9 drm_kms_helper,amd_sched,amdttm,amdgpu,amddrm_buddy,amd_kcl,amddrm_ttm_helper,amdxcpc
i2c_algo_bit          16384    1 amdgpu
bash-4.2# sudo modprobe -r amdgpu
bash-4.2# sudo lsmod|grep amdgpu
bash-4.2# sudo modprobe amdgpu
bash-4.2# sudo lsmod|grep amdgpu
amdgpu                15417344  0
amddrm_ttm_helper     16384    1 amdgpu
amdttm                90112    2 amdgpu,amddrm_ttm_helper
amdxcpc               16384    1 amdgpu
amddrm_buddy          20480    1 amdgpu
amd_sched             53248    1 amdgpu
amd_kcl               49152    3 amd_sched,amdttm,amdgpu
drm_kms_helper        307200   4 amdgpu
drm                   618496   9 drm_kms_helper,amd_sched,amdttm,amdgpu,amddrm_buddy,amd_kcl,amddrm_ttm_helper,amdxcpc
i2c_algo_bit          16384    1 amdgpu
bash-4.2#
```


AMD SMI C++ API REFERENCE

This section provides comprehensive documentation for the AMD SMI C++ API. Explore these sections to understand the full scope of available functionalities and how to implement them in your applications.

- *Modules*
- *Files*
- *Globals*
- *Data structures*

8.1 Modules

8.2 File List

8.3 Globals

8.4 Data Structures

8.5 Data Fields

8.5.1 All

Data Fields

Data Fields

Data Fields

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8.5.2 Variables

Data Fields - Variables

Data Fields - Variables

Data Fields - Variables

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AMD SMI PYTHON API REFERENCE

The AMD SMI Python interface provides a convenient way to interact with AMD hardware through a simple and accessible API. Compatible with Python 3.6 and higher, this library requires the AMD driver to be loaded for initialization – review the *prerequisites*.

This section provides comprehensive documentation for the AMD SMI Python API. Explore these sections to understand the full scope of available functionalities and how to implement them in your applications.

9.1 API

9.1.1 amdsmi_init

Description: Initialize amdsmi with AmdSmiInitFlags

Input parameters: AmdSmiInitFlags

Output: None

Exceptions that can be thrown by amdsmi_init function:

- AmdSmiLibraryException

Initialize GPUs only example:

```
try:
    # by default we initialize with AmdSmiInitFlags.INIT_AMD_GPUS
    ret = amdsmi_init()
    # continue with amdsmi
except AmdSmiException as e:
    print("Init GPUs failed")
    print(e)
```

Initialize CPUs only example:

```
try:
    ret = amdsmi_init(AmdSmiInitFlags.INIT_AMD_CPUS)
    # continue with amdsmi
except AmdSmiException as e:
    print("Init CPUs failed")
    print(e)
```

Initialize both GPUs and CPUs example:

```
try:
    ret = amdsmi_init(AmdSmiInitFlags.INIT_AMD_APUS)
    # continue with amdsmi
except AmdSmiException as e:
    print("Init both GPUs & CPUs failed")
    print(e)
```

9.1.2 amdsmi_shut_down

Description: Finalize and close connection to driver

Input parameters: None

Output: None

Exceptions that can be thrown by amdsmi_shut_down function:

- AmdSmiLibraryException

Example:

```
try:
    amdsmi_init()
    amdsmi_shut_down()
except AmdSmiException as e:
    print("Shut down failed")
    print(e)
```

9.1.3 amdsmi_get_processor_type

Description: Checks the type of device with provided handle.

Input parameters: device handle as an instance of amdsmi_processor_handle

Output: Integer, type of gpu

Exceptions that can be thrown by amdsmi_get_processor_type function:

- AmdSmiLibraryException

Example:

```
try:
    type_of_GPU = amdsmi_get_processor_type(processor_handle)
    if type_of_GPU == 1:
        print("This is an AMD GPU")
except AmdSmiException as e:
    print(e)
```

9.1.4 amdsmi_get_processor_handles

Description: Returns list of GPU device handle objects on current machine

Input parameters: None

Output: List of GPU device handle objects

Exceptions that can be thrown by amdsmi_get_processor_handles function:

- AmdSmiLibraryException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            print(amdsmi_get_gpu_device_uuid(device))
except AmdSmiException as e:
    print(e)
```

9.1.5 amdsmi_get_socket_handles

Note: CURRENTLY HARDCODED TO RETURN DUMMY DATA

Description: Returns list of socket device handle objects on current machine

Input parameters: None

Output: List of socket device handle objects

Exceptions that can be thrown by amdsmi_get_socket_handles function:

- AmdSmiLibraryException

Example:

```
try:
    sockets = amdsmi_get_socket_handles()
    print('Socket numbers: {}'.format(len(sockets)))
except AmdSmiException as e:
    print(e)
```

9.1.6 amdsmi_get_socket_info

Note: CURRENTLY HARDCODED TO RETURN EMPTY VALUES

Description: Return socket name

Input parameters: socket_handle socket handle

Output: Socket name

Exceptions that can be thrown by amdsmi_get_socket_info function:

- AmdSmiLibraryException

Example:

```
try:
    socket_handles = amdsmi_get_socket_handles()
    if len(socket_handles) == 0:
        print("No sockets on machine")
    else:
        for socket in socket_handles:
            print(amdsmi_get_socket_info(socket))
except AmdSmiException as e:
    print(e)
```

9.1.7 amdsmi_get_processor_handle_from_bdf

Description: Returns device handle from the given BDF

Input parameters: bdf string in form of either <domain>:<bus>:<device>.<function> or <bus>:<device>.<function> in hexcode format. Where:

- <domain> is 4 hex digits long from 0000-FFFF interval
- <bus> is 2 hex digits long from 00-FF interval
- <device> is 2 hex digits long from 00-1F interval
- <function> is 1 hex digit long from 0-7 interval

Output: device handle object

Exceptions that can be thrown by amdsmi_get_processor_handle_from_bdf function:

- AmdSmiLibraryException
- AmdSmiBdfFormatException

Example:

```
try:
    device = amdsmi_get_processor_handle_from_bdf("0000:23:00.0")
    print(amdsmi_get_gpu_device_uuid(device))
except AmdSmiException as e:
    print(e)
```

9.1.8 amdsmi_get_gpu_device_bdf

Description: Returns BDF of the given device

Input parameters:

- processor_handle dev for which to query

Output: BDF string in form of <domain>:<bus>:<device>.<function> in hexcode format. Where:

- <domain> is 4 hex digits long from 0000-FFFF interval
- <bus> is 2 hex digits long from 00-FF interval
- <device> is 2 hex digits long from 00-1F interval
- <function> is 1 hex digit long from 0-7 interval

Exceptions that can be thrown by amdsmi_get_gpu_device_bdf function:

- AmdSmiParameterException
- AmdSmiLibraryException

Example:

```
try:
    device = amdsmi_get_processor_handles()[0]
    print("Device's bdf:", amdsmi_get_gpu_device_bdf(device))
except AmdSmiException as e:
    print(e)
```

9.1.9 amdsmi_get_gpu_device_uuid

Description: Returns the UUID of the device

Input parameters:

- `processor_handle` dev for which to query

Output: UUID string unique to the device

Exceptions that can be thrown by `amdsmi_get_gpu_device_uuid` function:

- `AmdSmiParameterException`
- `AmdSmiLibraryException`

Example:

```
try:
    device = amdsmi_get_processor_handles()[0]
    print("Device UUID: ", amdsmi_get_gpu_device_uuid(device))
except AmdSmiException as e:
    print(e)
```

9.1.10 amdsmi_get_gpu_enumeration_info

Description: Returns enumeration information for the given GPU

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Content
<code>drm_render</code>	DRM render ID
<code>drm_card</code>	DRM card ID
<code>hsa_id</code>	HSA ID
<code>hip_id</code>	HIP ID
<code>hip_uuid</code>	HIP UUID

Exceptions that can be thrown by `amdsmi_get_gpu_enumeration_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    for device in devices:
        info = amdsmi_get_gpu_enumeration_info(device)
        print("DRM Render ID:", info['drm_render'])
        print("DRM Card ID:", info['drm_card'])
        print("HSA ID:", info['hsa_id'])
        print("HIP ID:", info['hip_id'])
```

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```

    print("HIP UUID:", info['hip_uuid'])
except AmdSmiException as e:
    print(e)

```

9.1.11 amdsmi_get_gpu_driver_info

Description: Returns the info of the driver

Input parameters:

- `processor_handle` dev for which to query

Output: Dictionary with fields

Field	Content
<code>driver_name</code>	driver name
<code>driver_version</code>	driver_version
<code>driver_date</code>	driver_date

Exceptions that can be thrown by `amdsmi_get_gpu_driver_info` function:

- `AmdSmiParameterException`
- `AmdSmiLibraryException`

Example:

```

try:
    device = amdsmi_get_processor_handles()[0]
    print("Driver info: ", amdsmi_get_gpu_driver_info(device))
except AmdSmiException as e:
    print(e)

```

9.1.12 amdsmi_get_gpu_asic_info

Description: Returns asic information for the given GPU

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Content
<code>market_name</code>	market name
<code>vendor_id</code>	vendor id
<code>vendor_name</code>	vendor name
<code>device_id</code>	device id
<code>rev_id</code>	revision id
<code>asic_serial</code>	asic serial
<code>oam_id</code>	oam id
<code>num_of_compute_units</code>	number of compute units on asic
<code>target_graphics_version</code>	hardware graphics version
<code>subsystem_id</code>	subsystem id

Exceptions that can be thrown by `amdsmi_get_gpu_asic_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            asic_info = amdsmi_get_gpu_asic_info(device)
            print(asic_info)
except AmdSmiException as e:
    print(e)
```

9.1.13 amdsmi_get_gpu_kfd_info

Description: Returns KFD (kernel driver) information for the given GPU This correlates to GUID in rocm-smi

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Content
<code>kfd_id</code>	KFD's unique GPU identifier
<code>node_id</code>	KFD's internal GPU index

Exceptions that can be thrown by `amdsmi_get_gpu_kfd_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            kfd_info = amdsmi_get_gpu_kfd_info(device)
            print(kfd_info)
except AmdSmiException as e:
    print(e)
```

9.1.14 amdsmi_get_power_cap_info

Description: Returns dictionary of power capabilities as currently configured on the given GPU. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Description	Units
<code>power_cap</code>	power capability	uW
<code>dpm_cap</code>	dynamic power management capability	MHz
<code>default_power_cap</code>	default power capability	uW
<code>min_power_cap</code>	min power capability	uW
<code>max_power_cap</code>	max power capability	uW

Exceptions that can be thrown by `amdsmi_get_power_cap_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            power_cap_info = amdsmi_get_power_cap_info(device)
            print(power_cap_info['power_cap'])
            print(power_cap_info['dpm_cap'])
            print(power_cap_info['default_power_cap'])
            print(power_cap_info['min_power_cap'])
            print(power_cap_info['max_power_cap'])
except AmdSmiException as e:
    print(e)
```

9.1.15 amdsmi_get_gpu_vram_info

Description: Returns dictionary of vram information for the given GPU.

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Description
vram_type	vram type
vram_vendor	vram vendor
vram_size	vram size in mb
vram_bit_width	vram bit width

Exceptions that can be thrown by `amdsmi_get_gpu_vram_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vram_info = amdsmi_get_gpu_vram_info(device)
            print(vram_info['vram_type'])
            print(vram_info['vram_vendor'])
            print(vram_info['vram_size'])
            print(vram_info['vram_bit_width'])
except AmdSmiException as e:
    print(e)
```

9.1.16 amdsmi_get_gpu_board_info

Description: Returns board info for the given GPU

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields correctable and uncorrectable

Field	Description
<code>model_number</code>	Board serial number
<code>product_serial</code>	Product serial
<code>fru_id</code>	FRU ID
<code>product_name</code>	Product name
<code>manufacturer_name</code>	Manufacturer name

Exceptions that can be thrown by `amdsmi_get_gpu_board_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    device = amdsmi_get_processor_handle_from_bdf("0000:23.00.0")
    board_info = amdsmi_get_gpu_board_info(device)
    print(board_info["model_number"])
    print(board_info["product_serial"])
    print(board_info["fru_id"])
    print(board_info["product_name"])
    print(board_info["manufacturer_name"])
except AmdSmiException as e:
    print(e)

```

9.1.17 amdsmi_get_gpu_cache_info

Description: Returns a list of dictionaries containing cache information for the given GPU.

Input parameters:

- processor_handle device which to query

Output: List of Dictionaries containing cache information following the schema below: Schema:

```

{
  "cache_properties":
    {
      "type" : "array",
      "items" : {"type" : "string"}
    },
  "cache_size": {"type" : "number"},
  "cache_level": {"type" : "number"},
  "max_num_cu_shared": {"type" : "number"},
  "num_cache_instance": {"type" : "number"}
}

```

Field	Description
cache_proper	list of up to 4 cache property type strings. Ex. data ("DATA_CACHE"), instruction ("INST_CACHE"), CPU ("CPU_CACHE"), or SIMD ("SIMD_CACHE").
cache_size	size of cache in KB
cache_level	level of cache
max_num_cu_s	max number of compute units shared
num_cache_in	number of cache instances

Exceptions that can be thrown by amdsmi_get_gpu_cache_info function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:

```

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```

    print("No GPUs on machine")
else:
    for device in devices:
        cache_info = amdsmi_get_gpu_cache_info(device)
        for cache_index, cache_values in cache_info.items():
            print(cache_values['cache_properties'])
            print(cache_values['cache_size'])
            print(cache_values['cache_level'])
            print(cache_values['max_num_cu_shared'])
            print(cache_values['num_cache_instance'])
except AmdSmiException as e:
    print(e)

```

9.1.18 amdsmi_get_gpu_vbios_info

Description: Returns the static information for the VBIOS on the device.

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Description
<code>name</code>	vbios name
<code>build_date</code>	vbios build date
<code>part_number</code>	vbios part number
<code>version</code>	vbios version string

Exceptions that can be thrown by `amdsmi_get_gpu_vbios_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vbios_info = amdsmi_get_gpu_vbios_info(device)
            print(vbios_info['name'])
            print(vbios_info['build_date'])
            print(vbios_info['part_number'])
            print(vbios_info['version'])
except AmdSmiException as e:
    print(e)

```

9.1.19 amdsmi_get_fw_info

Description: Returns GPU firmware related information.

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Description
<code>fw_list</code>	List of dictionaries that contain information about a certain firmware block

Exceptions that can be thrown by `amdsmi_get_fw_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            firmware_list = amdsmi_get_fw_info(device)['fw_list']
            for firmware_block in firmware_list:
                print(firmware_block['fw_name'])
                # String formatted hex or decimal value ie: 21.00.00.AC or 130
                print(firmware_block['fw_version'])
except AmdSmiException as e:
    print(e)
```

9.1.20 amdsmi_get_gpu_activity

Description: Returns the engine usage for the given GPU. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: Dictionary of activities to their respective usage percentage or 'N/A' if not supported

Field	Description
<code>gfx_activity</code>	graphics engine usage percentage (0 - 100)
<code>umc_activity</code>	memory engine usage percentage (0 - 100)
<code>mm_activity</code>	average multimedia engine usages in percentage (0 - 100)

Exceptions that can be thrown by `amdsmi_get_gpu_activity` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`

- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            engine_usage = amdsmi_get_gpu_activity(device)
            print(engine_usage['gfx_activity'])
            print(engine_usage['umc_activity'])
            print(engine_usage['mmm_activity'])
except AmdSmiException as e:
    print(e)
```

9.1.21 amdsmi_get_power_info

Description: Returns the current power and voltage for the given GPU. It is not supported on virtual machine guest

Input parameters:

- processor_handle device which to query

Output: Dictionary with fields

Field	Description	Units
socket_power	socket power; matches current or average socket power	W
current_socket_power	current socket power; Mi300+ Series Cards	W
average_socket_power	average socket power; Navi + Mi 200 and earlier Series cards	W
gfx_voltage	voltage gfx	mV
soc_voltage	voltage soc	mV
mem_voltage	voltage mem	mV
power_limit	power limit	W

Exceptions that can be thrown by amdsmi_get_power_info function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            power_info = amdsmi_get_power_info(device)
            print(power_info['current_socket_power'])
            print(power_info['average_socket_power'])
            print(power_info['gfx_voltage'])
```

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```

        print(power_info['soc_voltage'])
        print(power_info['mem_voltage'])
        print(power_info['power_limit'])
    except AmdSmiException as e:
        print(e)

```

9.1.22 amdsmi_get_gpu_vram_usage

Description: Returns total VRAM and VRAM in use

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Description
<code>vram_total</code>	VRAM total
<code>vram_used</code>	VRAM currently in use

Exceptions that can be thrown by `amdsmi_get_gpu_vram_usage` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vram_usage = amdsmi_get_gpu_vram_usage(device)
            print(vram_usage['vram_used'])
            print(vram_usage['vram_total'])
except AmdSmiException as e:
    print(e)

```

9.1.23 amdsmi_get_violation_status

Description: Returns dictionary of violation status information for the given GPU.

Input parameters:

- `processor_handle` The identifier of the given device as an instance of `amdsmi_processor_handle`.
- `*violation_status` pointer to object of type `amdsmi_violation_status_t` to get the violation status information

Output: Dictionary with fields

Field	Description
reference_timestamp	CPU Time Since Epoch in Microseconds
violation_timestamp	Time of Violation in Nanoseconds
acc_counter	Current Accumulated Counter
acc_prochot_thrm	Current Accumulated Processor Hot Violation Count
acc_ppt_pwr	Current Accumulated Package Power Tracking (PPT) PVIOL
acc_socket_thrm	Current Accumulated Socket Thermal Count #TVIOL
acc_vr_thrm	Current Accumulated Voltage Regulator Count
acc_hbm_thrm	Current Accumulated High Bandwidth Memory (HBM) Thermal Count
acc_gfx_clk_below_host_limit	Current Graphic Clock Below Host Limit Count. UPDATED in new driver 1.8: us
acc_gfx_clk_below_host_limit_pwr	2D array with Accumulated GFX Clk Below Host Limit (Power) per XCP/XCC
acc_gfx_clk_below_host_limit_thm	2D array with Accumulated GFX Clk Below Host Limit (Thermal) per XCP/XCC
acc_low_utilization	2D array with Accumulated Low Utilization per XCP/XCC
acc_gfx_clk_below_host_limit_total	2D array with Accumulated GFX Clk Below Host Limit (Total) per XCP/XCC
per_prochot_thrm	Processor hot violation % (greater than 0% is a violation)
per_ppt_pwr	PVIOL Package Power Tracking (PPT) violation % (greater than 0% is a violation)
per_socket_thrm	TVIOL; Socket thermal violation % (greater than 0% is a violation)
per_vr_thrm	Voltage regulator violation % (greater than 0% is a violation)
per_hbm_thrm	High Bandwidth Memory (HBM) thermal violation % (greater than 0% is a violati
per_gfx_clk_below_host_limit	Graphics clock below host limit violation % (greater than 0% is a violation). UPD
per_gfx_clk_below_host_limit_pwr	2D array with GFX Clk Below Host Limit Violation % (Power) per XCP/XCC
per_gfx_clk_below_host_limit_thm	2D array with GFX Clk Below Host Limit Violation % (Thermal) per XCP/XCC
per_low_utilization	2D array with Low Utilization Violation % per XCP/XCC
per_gfx_clk_below_host_limit_total	2D array with GFX Clk Below Host Limit Violation % (Total) per XCP/XCC
active_prochot_thrm	Processor hot violation; 1 = active 0 = not active
active_ppt_pwr	Package Power Tracking (PPT) violation; 1 = active 0 = not active
active_socket_thrm	Socket thermal violation; 1 = active 0 = not active
active_vr_thrm	Voltage regulator violation; 1 = active 0 = not active
active_hbm_thrm	High Bandwidth Memory (HBM) thermal violation; 1 = active 0 = not active
active_gfx_clk_below_host_limit	Graphics Clock Below Host Limit Violation; 1 = Active 0 = Not Active. UPDATE
active_gfx_clk_below_host_limit_pwr	2D array with GFX Clk Below Host Limit Violation Active (Power) per XCP/XCC
active_gfx_clk_below_host_limit_thm	2D array with GFX Clk Below Host Limit Violation Active (Thermal) per XCP/XC
active_low_utilization	2D array with Low Utilization Violation Active per XCP/XCC
active_gfx_clk_below_host_limit_total	2D array with GFX Clk Below Host Limit Violation Active (Total) per XCP/XCC

Exceptions that can be thrown by `amdsmi_get_violation_status` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`
- `AmdSmiTimeoutException`

Example:

```
try:
    violation_status = amdsmi_interface.amdsmi_get_violation_status(args.gpu)
    throttle_status['accumulation_counter'] = violation_status['acc_counter']
    throttle_status['prochot_accumulated'] = violation_status['acc_prochot_thrm']
    throttle_status['ppt_accumulated'] = violation_status['acc_ppt_pwr']
    throttle_status['socket_thermal_accumulated'] = violation_status['acc_socket_thrm']
    throttle_status['vr_thermal_accumulated'] = violation_status['acc_vr_thrm']
    throttle_status['hbm_thermal_accumulated'] = violation_status['acc_hbm_thrm']
```

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```

    throttle_status['gfx_clk_below_host_limit_accumulated'] = violation_status['acc_gfx_
↪clk_below_host_limit']
    throttle_status['gfx_clk_below_host_limit_pwr_accumulated'] = violation_status['acc_
↪gfx_clk_below_host_limit_pwr']
    throttle_status['gfx_clk_below_host_limit_thm_accumulated'] = violation_status['acc_
↪gfx_clk_below_host_limit_thm']
    throttle_status['low_utilization_accumulated'] = violation_status['acc_low_
↪utilization']
    throttle_status['gfx_clk_below_host_limit_total_accumulated'] = violation_status[
↪'acc_gfx_clk_below_host_limit_total']

    throttle_status['prochot_violation_status'] = violation_status['active_prochot_thrm']
    throttle_status['ppt_violation_status'] = violation_status['active_ppt_pwr']
    throttle_status['socket_thermal_violation_status'] = violation_status['active_socket_
↪thrm']
    throttle_status['vr_thermal_violation_status'] = violation_status['active_vr_thrm']
    throttle_status['hbm_thermal_violation_status'] = violation_status['active_hbm_thrm']
    throttle_status['gfx_clk_below_host_limit_violation_status'] = violation_status[
↪'active_gfx_clk_below_host_limit']
    throttle_status['gfx_clk_below_host_limit_pwr_violation_status'] = violation_status[
↪'active_gfx_clk_below_host_limit_pwr']
    throttle_status['gfx_clk_below_host_limit_thm_violation_status'] = violation_status[
↪'active_gfx_clk_below_host_limit_thm']
    throttle_status['low_utilization_violation_status'] = violation_status['active_low_
↪utilization']
    throttle_status['gfx_clk_below_host_limit_total_violation_status'] = violation_
↪status['active_gfx_clk_below_host_limit_total']

    throttle_status['prochot_violation_activity'] = violation_status['per_prochot_thrm']
    throttle_status['ppt_violation_activity'] = violation_status['per_ppt_pwr']
    throttle_status['socket_thermal_violation_activity'] = violation_status['per_socket_
↪thrm']
    throttle_status['vr_thermal_violation_activity'] = violation_status['per_vr_thrm']
    throttle_status['hbm_thermal_violation_activity'] = violation_status['per_hbm_thrm']
    throttle_status['gfx_clk_below_host_limit_violation_activity'] = violation_status[
↪'per_gfx_clk_below_host_limit']
    throttle_status['gfx_clk_below_host_limit_pwr_violation_activity'] = violation_
↪status['per_gfx_clk_below_host_limit_pwr']
    throttle_status['gfx_clk_below_host_limit_thm_violation_activity'] = violation_
↪status['per_gfx_clk_below_host_limit_thm']
    throttle_status['low_utilization_violation_activity'] = violation_status['per_low_
↪utilization']
    throttle_status['gfx_clk_below_host_limit_total_violation_activity'] = violation_
↪status['per_gfx_clk_below_host_limit_total']

except AmdSmiException as e:
    print(e)

```

9.1.24 amdsmi_get_clock_info

Description: Returns the clock measure for the given GPU. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query
- `clock_type` one of `AmdSmiClkType` enum values:

Field	Description
SYS	SYS clock type
GFX	GFX clock type
DF	DF clock type
DCEF	DCEF clock type
SOC	SOC clock type
MEM	MEM clock type
PCIE	PCIE clock type
VCLK0	VCLK0 clock type
VCLK1	VCLK1 clock type
DCLK0	DCLK0 clock type
DCLK1	DCLK1 clock type

Output: Dictionary with fields

Field	Description
<code>clk</code>	Current clock for given clock type
<code>min_clk</code>	Minimum clock for given clock type
<code>max_clk</code>	Maximum clock for given clock type
<code>clk_locked</code>	flag only supported on GFX clock domain
<code>clk_deep_sleep</code>	clock deep sleep mode flag

Exceptions that can be thrown by `amdsmi_get_clock_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            clock_measure = amdsmi_get_clock_info(device, AmdSmiClkType.GFX)
            print(clock_measure['clk'])
            print(clock_measure['min_clk'])
            print(clock_measure['max_clk'])
            print(clock_measure['clk_locked'])
            print(clock_measure['clk_deep_sleep'])
```

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```
except AmdSmiException as e:
    print(e)
```

9.1.25 amdsmi_get_pcie_info

Description: Returns the pcie metric and static information for the given GPU. For accurate PCIe Bandwidth measurements it is recommended to use this function once per 1000ms It is not supported on virtual machine guest

Input parameters:

- processor_handle device which to query

Output: Dictionary with 2 fields pcie_static and pcie_metric

Field	Description
pcie	Subfield Description max_pcie_widthMaximum number of pcie lanes availablemax_pcie_speedMaximum capable pcie speed in GT/spcie_interface_versionPCIe generation ie. 3,4,5... slot_typeThe type of form factor of the slot: OAM, PCIE, CEM, or Unknown
pcie	Subfield Description pcie_widthCurrent number of pcie lanes availablepcie_speedCurrent pcie speed capable in GT/spcie_bandwidthCurrent instantaneous bandwidth usage in Mb/spcie_replay_countTotal number of PCIe replays (NAKs)pcie_l0_to_recovery_countPCIe L0 to recovery state transition accumulated countpcie_replay_roll_over_countPCIe Replay accumulated countpcie_nak_sent_countPCIe NAK sent accumulated countpcie_nak_received_countPCIe NAK received accumulated count

Exceptions that can be thrown by amdsmi_get_pcie_info function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            pcie_info = amdsmi_get_pcie_info(device)
            print(pcie_info["pcie_static"])
            print(pcie_info["pcie_metric"])
except AmdSmiException as e:
    print(e)
```

9.1.26 amdsmi_get_gpu_bad_page_info

Description: Returns bad page info for the given GPU. It is not supported on virtual machine guest

Input parameters:

- processor_handle device which to query

Output: List consisting of dictionaries with fields for each bad page found; can be an empty list

Field	Description
value	Value of page
page_address	Address of bad page
page_size	Size of bad page
status	Status of bad page

Exceptions that can be thrown by `amdsmi_get_gpu_bad_page_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            bad_page_info = amdsmi_get_gpu_bad_page_info(device)
            if not bad_page_info: # Can be empty list
                print("No bad pages found")
                continue
            for bad_page in bad_page_info:
                print(bad_page["value"])
                print(bad_page["page_address"])
                print(bad_page["page_size"])
                print(bad_page["status"])
except AmdSmiException as e:
    print(e)
```

9.1.27 amdsmi_get_gpu_bad_page_threshold

Description: Returns bad page threshold for the given GPU; Requires root level access to display bad page threshold count; otherwise will return "N/A". It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: Bad page threshold value

Exceptions that can be thrown by `amdsmi_get_gpu_bad_page_threshold` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            threshold = amdsmi_get_gpu_bad_page_threshold(device)
            print(bad_page["threshold"])
except AmdSmiException as e:
    print(e)

```

9.1.28 amdsmi_get_gpu_memory_reserved_pages

Description: Returns reserved memory page info for the given GPU. It is not supported on virtual machine guest

Input parameters:

- processor_handle device which to query

Output: List consisting of dictionaries with fields for each reserved memory page found; can be an empty list

Field	Description
value	Value of memory reserved page
page_address	Address of memory reserved page
page_size	Size of memory reserved page
status	Status of memory reserved page

Exceptions that can be thrown by amdsmi_get_gpu_memory_reserved_pages function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            reserved_memory_page_info = amdsmi_get_gpu_memory_reserved_pages(device)
            if not reserved_memory_page_info: # Can be empty list
                print("No memory reserved pages found")
                continue
            for reserved_memory_page in reserved_memory_page_info:
                print(reserved_memory_page["value"])
                print(reserved_memory_page["page_address"])
                print(reserved_memory_page["page_size"])
                print(reserved_memory_page["status"])
except AmdSmiException as e:
    print(e)

```

9.1.29 amdsmi_get_gpu_process_list

Description: Returns the list of processes running on the target GPU; Requires root level access to display root process names; otherwise will return “N/A”

Input parameters:

- `processor_handle` device which to query

Output: List of Dictionaries with the corresponding fields; empty list if no running process are detected

Field	Description
<code>name</code>	Name of process. If user does not have permission this will be “N/A”
<code>pid</code>	Process ID
<code>mem</code>	Total memory usage by GPU during process in Bytes
<code>engine_us:</code>	Subfield Description <code>gfxGFX</code> engine usage in <code>nsencEncode</code> engine usage in <code>ns</code>
<code>memory_us:</code>	Subfield Description <code>gtt_memGTT</code> memory usage in Bytes <code>cpu_memCPU</code> memory usage in Bytes <code>vram_memProcess</code> VRAM memory usage in Bytes
<code>cu_occupa</code>	Number of Compute Units utilized

Exceptions that can be thrown by `amdsmi_get_gpu_process_list` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            processes = amdsmi_get_gpu_process_list(device)
            if len(processes) == 0:
                print("No processes running on this GPU")
            else:
                for process in processes:
                    print(process)
except AmdSmiException as e:
    print(e)
```

9.1.30 amdsmi_get_gpu_total_ecc_count

Description: Returns the ECC error count for the given GPU. It is not supported on virtual machine guest

See [RAS Error Count sysfs Interface \(AMDGPU RAS Support - Linux Kernel documentation\)](#) to learn how these error counts are accessed.

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Description
correctable_count	Correctable ECC error count
uncorrectable_count	Uncorrectable ECC error count
deferred_count	Deferred ECC error count

Exceptions that can be thrown by `amdsmi_get_gpu_total_ecc_count` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            ecc_error_count = amdsmi_get_gpu_total_ecc_count(device)
            print(ecc_error_count["correctable_count"])
            print(ecc_error_count["uncorrectable_count"])
except AmdSmiException as e:
    print(e)
```

9.1.31 amdsmi_get_gpu_cper_entries

Description: Dump CPER entries for a given GPU in a file using from CPER header file from RAS tool.

Input parameters:

- `processor_handle` device which to query
- `severity_mask` the severity mask of the entries to be retrieved: 1: 'nonfatal-uncorrected', 2: 'fatal', 4: 'nonfatal-corrected', 'corrected', 7: 'all'
- `buffer_size` number of bytes that will be used to create a buffer for copying cper entries into; default is 1048576 bytes
- `cursor` the zero based index at which to start retrieving cper entries; default value is 0; for example, if there are 10 cper entries available, then with a cursor value of 8, it will retrieve the last two cper entries only

Output: Dictionary with fields, updated cursor, and a dictionary of the `cper_data`, `status_code` `status_code`:
AMDSMI_STATUS_SUCCESS: If all entries were retrieved successfully
AMDSMI_STATUS_MORE_DATA: If some of the entries were retrieved and:
 * A subsequent call to the API with the updated cursor will result in the fetching the next batch of entries, or
 * Increasing the input `buffer_size` will allow more entries to be fetched with the same cursor

Field	Description
error_severity	The severity of the CPER error ex: non_fatal_uncorrected, fatal, non_fatal_corrected.
notify_type	The notification type associated with the CPER entry.
timestamp	The time when the CPER entry was recorded, formatted as YYYY/MM/DD HH:MM:SS.
signature	A 4-byte signature identifying the entry, typically CPER.
revision	The revision number of the CPER record format.
signature_end	A marker value (typically 0xFFFFFFFF) confirming the integrity of the signature.
sec_cnt	The count of sections included in the CPER entry.
record_length	The total length in bytes of the CPER entry.
platform_id	A character array identifying the GPU or platform.
creator_id	A character array indicating the creator of the CPER entry.
record_id	A unique identifier for the CPER entry.
flags	Reserved flags related to the CPER entry.
persistence_info	Reserved information related to persistence.

Exceptions that can be thrown by `amdsmi_get_gpu_cper_entries` function:

- `AmdSmiLibraryException`
- `AmdSmiParameterException`

Example:

```
try:
    entries, new_cursor, cper_data, status_code = amdsmi_get_gpu_cper_entries(
        device, severity_mask, buffer_size, initial_cursor)
except AmdSmiException as e:
    print(e)
```

Refer to `amd_smi_cper_example.py` for a complete example

9.1.32 `amdsmi_get_afids_from_cper`

Description: Get the AFIDs from CPER buffer

Input parameters:

- `cper_afid_data`: Either - raw bytes or bytearray of a single CPER record, or - a list of dicts each with keys “bytes” (List[int]) and “size” (int).

Output: Tuple[List[int], int]: A tuple containing: - A list of extracted AFIDs. - The total count of AFIDs.

- `status_code` | Upon successful retrieval of data, `status_code` will be `AMDSMI_STATUS_SUCCESS` (0) or `AMDSMI_STATUS_MORE_DATA` (39) if more data can be retrieve by subsequent call to the `amdsmi_get_gpu_cper_entries` function. In the later case, the input parameter `cursor` should be set to the updated `cursor` that was returned from the previous call.

Exceptions that can be thrown by `amdsmi_get_gpu_cper_entries` function:

- `AmdSmiParameterException`
- `AmdSmiLibraryException` with these possible error codes: `AMDSMI_STATUS_INVALID`, `AMDSMI_STATUS_UNEXPECTED_SIZE`, `AMDSMI_STATUS_UNEXPECTED_DATA`, `AMDSMI_STATUS_NOT_SUPPORTED`

Example:

```

try:
    with open(cper_file.path, "rb") as file:
        afids, num_afids = amdsmi_interface.amdsmi_get_afids_from_cper(file.read())
except AmdSmiException as e:
    print(e)

```

Refer to `amd_smi_afid_example.py` for a complete example

9.1.33 amdsmi_get_gpu_ras_feature_info

Description: Returns RAS version and schema information It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: List containing dictionaries with fields

Field	Description
<code>eeeprom_version</code>	eeeprom version
<code>parity_schema</code>	parity schema
<code>single_bit_schema</code>	single bit schema
<code>double_bit_schema</code>	double bit schema
<code>poison_schema</code>	poison schema

Exceptions that can be thrown by `amdsmi_get_gpu_ras_feature_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

from amdsmi import *
import os

amdsmi_init()

def amdsmi_get_afids_from_cper():
    directory_path = "/tmp/cper_dump/"
    print(f"Searching for cper file in {directory_path}")
    with os.scandir(directory_path) as cper_files:
        for cper_file in cper_files:
            if cper_file.is_file():
                if ".bin" in cper_file.path:
                    print(f"Found {cper_file.path}")
                    with open(cper_file.path, "rb") as file:
                        raw = file.read()
                        afids, num_afids = amdsmi_interface.amdsmi_get_afids_from_
↪ cper(raw)

                    print(f"afids: {afids}")

```

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```
amdsmi_get_afids_from_cper()
```

Output:

```
sudo python3 afid.py
Searching for cper file in /tmp/cper_dump/
Found /tmp/cper_dump/cper_entry_0.bin
afids: [17]
Found /tmp/cper_dump/cper_entry_1.bin
afids: [17]
```

9.1.34 amdsmi_get_gpu_ras_block_features_enabled

Description: Returns status of each RAS block for the given GPU. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: List containing dictionaries with fields for each RAS block

Field	Description
<code>block</code>	RAS block
<code>status</code>	RAS block status

Exceptions that can be thrown by `amdsmi_get_gpu_ras_block_features_enabled` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            ras_block_features = amdsmi_get_gpu_ras_block_features_enabled(device)
            print(ras_block_features)
except AmdSmiException as e:
    print(e)
```

9.1.35 AmdSmiEventReader class

Description: Providing methods for event monitoring. This is context manager class. Can be used with `with` statement for automatic cleanup.

Methods:

Constructor

Description: Allocates a new event reader notifier to monitor different types of events for the given GPU

Input parameters:

- `processor_handle` device handle corresponding to the device on which to listen for events
- `event_types` list of event types from `AmdSmiEvtNotificationType` enum. Specifying which events to collect for the given device.

Event Type	Description
VMFAULT	VM page fault
THERMAL_TH	thermal throttle
GPU_PRE_RE	gpu pre reset; this event includes a message which indicates the cause of the reset. They are as follows: job hang, RAS error, MES hang, HWS hang, user trigger, and unknown
GPU_POST_R	gpu post reset
MIGRATE_ST	migrate start
MIGRATE_EN	migrate end
PAGE_FAULT	page fault start
PAGE_FAULT	page fault end
QUEUE_EVIC	queue eviction
QUEUE_REST	queue restore
UNMAP_FROM	unmap from GPU
PROCESS_ST	KFD process start
PROCESS_EN	KFD process end

read

Description: Reads events on the given device. When event is caught, device handle, message and event type are returned. Reading events stops when timestamp passes without event reading.

Input parameters:

- `timestamp` number of milliseconds to wait for an event to occur. If event does not happen monitoring is finished
- `num_elem` number of events. This is optional parameter. Default value is 10.

stop

Description: Any resources used by event notification for the the given device will be freed with this function. This can be used explicitly or automatically using `with` statement, like in the examples below. This should be called either manually or automatically for every created `AmdSmiEventReader` object.

Input parameters: None

Example with manual cleanup of `AmdSmiEventReader`:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        event = AmdSmiEventReader(device[0], AmdSmiEvtNotificationType.GPU_PRE_RESET,
        ↪AmdSmiEvtNotificationType.GPU_POST_RESET)
        event.read(10000)
```

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```

except AmdSmiException as e:
    print(e)
finally:
    event.stop()

```

Example with automatic cleanup using with statement:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        with AmdSmiEventReader(device[0], AmdSmiEvtNotificationType.GPU_PRE_RESET,
↪AmdSmiEvtNotificationType.GPU_POST_RESET) as event:
            event.read(10000)
except AmdSmiException as e:
    print(e)

```

9.1.36 amdsmi_set_gpu_pci_bandwidth

Description: Control the set of allowed PCIe bandwidths that can be used It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device
- bw_bitmask A bitmask indicating the indices of the bandwidths that are to be enabled (1) and disabled (0)

Output: None

Exceptions that can be thrown by amdsmi_set_gpu_pci_bandwidth function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_pci_bandwidth(device, 0)
except AmdSmiException as e:
    print(e)

```

9.1.37 amdsmi_set_power_cap

Description: Set the power cap value. It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device

- `sensor_ind` a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0
- `cap` int that indicates the desired power cap, in microwatts

Output: None

Exceptions that can be thrown by `amdsmi_set_power_cap` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            power_cap = 250 * 1000000
            amdsmi_set_power_cap(device, 0, power_cap)
except AmdSmiException as e:
    print(e)
```

9.1.38 `amdsmi_set_gpu_power_profile`

Description: Set the power profile. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `reserved` Not currently used, set to 0
- `profile` a `amdsmi_power_profile_preset_masks_t` that hold the mask of the desired new power profile

Output: None

Exceptions that can be thrown by `amdsmi_set_gpu_power_profile` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            profile = ...
            amdsmi_set_gpu_power_profile(device, 0, profile)
except AmdSmiException as e:
    print(e)
```

9.1.39 amdsmi_set_gpu_clk_range

Description: This function sets the clock range information. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `min_clk_value` minimum clock value for desired clock range
- `max_clk_value` maximum clock value for desired clock range
- `clk_type` `AMDSMI_CLK_TYPE_SYS` | `AMDSMI_CLK_TYPE_MEM` range type

Output: None

Exceptions that can be thrown by `amdsmi_set_gpu_clk_range` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_clk_range(device, 0, 1000, AmdSmiClkType.AMDSMI_CLK_TYPE_SYS)
except AmdSmiException as e:
    print(e)
```

9.1.40 amdsmi_get_gpu_bdf_id

Description: Get the unique PCI device identifier associated for a device

Input parameters:

- `processor_handle` device which to query

Output: device bdf The format of bdfid will be as follows:

$BDFID = ((DOMAIN \& 0xffff) \ll 32) | ((BUS \& 0xff) \ll 8) | ((DEVICE \& 0x1f) \ll 3) | (FUNCTION \& 0x7)$

Name	Field
Domain	[64:32]
Reserved	[31:16]
Bus	[15: 8]
Device	[7: 3]
Function	[2: 0]

Exceptions that can be thrown by `amdsmi_get_gpu_bdf_id` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            bdfid = amdsmi_get_gpu_bdf_id(device)
            print(bdfid)
except AmdSmiException as e:
    print(e)
```

9.1.41 amdsmi_get_gpu_pci_bandwidth

Description: Get the list of possible PCIe bandwidths that are available. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with the possible T/s values and associated number of lanes

Field	Content
<code>transfer_rate</code>	transfer_rate dictionary
<code>lanes</code>	lanes

transfer_rate dictionary

Field	Content
<code>num_supported</code>	num_supported
<code>current</code>	current
<code>frequency</code>	list of frequency

Exceptions that can be thrown by `amdsmi_get_gpu_pci_bandwidth` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            bandwidth = amdsmi_get_gpu_pci_bandwidth(device)
            print(bandwidth)
except AmdSmiException as e:
    print(e)
```

9.1.42 amdsmi_get_gpu_pci_throughput

Description: Get PCIe traffic information. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with the fields

Field	Content
<code>sent</code>	number of bytes sent in 1 second
<code>received</code>	the number of bytes received
<code>max_pkt_sz</code>	maximum packet size

Exceptions that can be thrown by `amdsmi_get_gpu_pci_throughput` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            pci = amdsmi_get_gpu_pci_throughput(device)
            print(pci)
except AmdSmiException as e:
    print(e)
```

9.1.43 amdsmi_get_gpu_pci_replay_counter

Description: Get PCIe replay counter

Input parameters:

- `processor_handle` device which to query

Output: counter value The sum of the NAK's received and generated by the GPU

Exceptions that can be thrown by `amdsmi_get_gpu_pci_replay_counter` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
```

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```

else:
    for device in devices:
        counter = amdsmi_get_gpu_pci_replay_counter(device)
        print(counter)
except AmdSmiException as e:
    print(e)

```

9.1.44 amdsmi_get_gpu_topo_numa_affinity

Description: Get the NUMA node associated with a device

Input parameters:

- `processor_handle` device which to query

Output: NUMA node value

Exceptions that can be thrown by `amdsmi_get_gpu_topo_numa_affinity` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            numa_node = amdsmi_get_gpu_topo_numa_affinity(device)
            print(numa_node)
except AmdSmiException as e:
    print(e)

```

9.1.45 amdsmi_get_energy_count

Description: Get the energy accumulator counter information of the device. $\text{energy_accumulator} * \text{counter_resolution} = \text{total_energy_consumption}$ in micro-Joules It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query

Output: Dictionary with fields

Field	Content
<code>power</code>	counter for energy accumulation since last restart/gpu rest (Deprecated in ROCm 6.4)
<code>energy_accumulator</code>	counter for energy accumulation since last restart/gpu rest
<code>counter_resolution</code>	counter resolution
<code>timestamp</code>	timestamp

Exceptions that can be thrown by `amdsmi_get_energy_count` function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            energy_dict = amdsmi_get_energy_count(device)
            print(energy_dict)
except AmdSmiException as e:
    print(e)
```

9.1.46 amdsmi_get_gpu_memory_total

Description: Get the total amount of memory that exists

Input parameters:

- processor_handle device which to query
- mem_type enum AmdSmiMemoryType

Output: total amount of memory

Exceptions that can be thrown by amdsmi_get_gpu_memory_total function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vram_memory_total = amdsmi_get_gpu_memory_total(device, amdsmi_interface.
↪AmdSmiMemoryType.VRAM)
            print(vram_memory_total)
            vis_vram_memory_total = amdsmi_get_gpu_memory_total(device, amdsmi_interface.
↪AmdSmiMemoryType.VIS_VRAM)
            print(vis_vram_memory_total)
            gtt_memory_total = amdsmi_get_gpu_memory_total(device, amdsmi_interface.
↪AmdSmiMemoryType.GTT)
            print(gtt_memory_total)
except AmdSmiException as e:
    print(e)
```

9.1.47 amdsmi_set_gpu_od_clk_info

Description: This function sets the clock frequency information. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `level` `AMDSMI_FREQ_IND_MIN|AMDSMI_FREQ_IND_MAX` to set the minimum (0) or maximum (1) speed
- `clk_value` value to apply to the clock range
- `clk_type` `AMDSMI_CLK_TYPE_SYS | AMDSMI_CLK_TYPE_MEM` range type

Output: None

Exceptions that can be thrown by `amdsmi_set_gpu_od_clk_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_od_clk_info(
                device,
                AmdSmiFreqInd.AMDSMI_FREQ_IND_MAX,
                1000,
                AmdSmiClkType.AMDSMI_CLK_TYPE_SYS
            )
except AmdSmiException as e:
    print(e)
```

9.1.48 amdsmi_get_gpu_memory_usage

Description: Get the current memory usage

Input parameters:

- `processor_handle` device which to query
- `mem_type` enum `AmdSmiMemoryType`

Output: the amount of memory currently being used

Exceptions that can be thrown by `amdsmi_get_gpu_memory_usage` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vram_memory_usage = amdsmi_get_gpu_memory_usage(device, amdsmi_interface.
↪AmdSmiMemoryType.VRAM)
            print(vram_memory_usage)
            vis_vram_memory_usage = amdsmi_get_gpu_memory_usage(device, amdsmi_interface.
↪AmdSmiMemoryType.VIS_VRAM)
            print(vis_vram_memory_usage)
            gtt_memory_usage = amdsmi_get_gpu_memory_usage(device, amdsmi_interface.
↪AmdSmiMemoryType.GTT)
            print(gtt_memory_usage)
except AmdSmiException as e:
    print(e)

```

9.1.49 amdsmi_set_gpu_od_volt_info

Description: This function sets 1 of the 3 voltage curve points. It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device
- vpoint voltage point [0|1|2] on the voltage curve
- clk_value clock value component of voltage curve point
- volt_value voltage value component of voltage curve point

Output: None

Exceptions that can be thrown by amdsmi_set_gpu_od_volt_info function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_od_volt_info(device, 1, 1000, 980)
except AmdSmiException as e:
    print(e)

```

9.1.50 amdsmi_get_gpu_fan_rpms

Description: Get the fan speed in RPMs of the device with the specified device handle and 0-based sensor index. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_idx` a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.

Output: Fan speed in rpms as integer

Exceptions that can be thrown by `amdsmi_get_gpu_fan_rpms` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            fan_rpm = amdsmi_get_gpu_fan_rpms(device, 0)
            print(fan_rpm)
except AmdSmiException as e:
    print(e)
```

9.1.51 amdsmi_get_gpu_fan_speed

Description: Get the fan speed for the specified device as a value relative to `AMDSMI_MAX_FAN_SPEED`. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_idx` a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.

Output: Fan speed in relative to MAX

Exceptions that can be thrown by `amdsmi_get_gpu_fan_speed` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
```

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```

else:
    for device in devices:
        fan_speed = amdsmi_get_gpu_fan_speed(device, 0)
        print(fan_speed)
except AmdSmiException as e:
    print(e)

```

9.1.52 amdsmi_get_gpu_fan_speed_max

Description: Get the max fan speed of the device with provided device handle. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_idx` a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.

Output: Max fan speed as integer

Exceptions that can be thrown by `amdsmi_get_gpu_fan_speed_max` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            max_fan_speed = amdsmi_get_gpu_fan_speed_max(device, 0)
            print(max_fan_speed)
except AmdSmiException as e:
    print(e)

```

9.1.53 amdsmi_is_gpu_power_management_enabled

Description: Returns is power management enabled

Input parameters:

- `processor_handle` GPU device which to query

Output: Bool true if power management enabled else false

Exceptions that can be thrown by `amdsmi_is_gpu_power_management_enabled` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for processor in devices:
            is_power_management_enabled = amdsmi_is_gpu_power_management_
↪enabled(processor)
            print(is_power_management_enabled)
except AmdSmiException as e:
    print(e)

```

9.1.54 amdsmi_get_temp_metric

Description: Get the temperature metric value for the specified metric, from the specified temperature sensor on the specified device. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_type` part of device from which temperature should be obtained
- `metric` enum indicated which temperature value should be retrieved

Output: Temperature as integer in millidegrees Celcius

Exceptions that can be thrown by `amdsmi_get_temp_metric` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            temp_metric = amdsmi_get_temp_metric(device, AmdSmiTemperatureType.EDGE,
↪AmdSmiTemperatureMetric.CURRENT)
            print(temp_metric)
except AmdSmiException as e:
    print(e)

```

9.1.55 amdsmi_get_gpu_volt_metric

Description: Get the voltage metric value for the specified metric, from the specified voltage sensor on the specified device. It is not supported on virtual machine guest

Input parameters:

Parameters	Description
<code>proc</code>	Handle for the given device
<code>sens</code>	Possible Values Description <code>AmdSmiVoltageType.VDDGFX</code> Represents the voltage supplied to the GPU's graphics core. <code>AmdSmiVoltageType.VDDBOARD</code> Represents the voltage supplied to the entire GPU board, including auxiliary components. Intended for Mi300+
<code>metr</code>	Possible Values Description <code>AmdSmiVoltageMetric.CURRENT</code> Represents the current voltage value measured at the specified sensor. <code>AmdSmiVoltageMetric.MAX</code> Represents the maximum voltage value recorded at the specified sensor. <code>AmdSmiVoltageMetric.MIN</code> Represents the minimum voltage value recorded at the specified sensor. <code>AmdSmiVoltageMetric.AVERAGE</code> Represents the average voltage value calculated over a period of time at the specified sensor. <code>AmdSmiVoltageMetric.MAX_CRIT</code> Represents the critical maximum voltage value that should not be exceeded. <code>AmdSmiVoltageMetric.MIN_CRIT</code> Represents the critical minimum voltage value that should not be dropped below. <code>AmdSmiVoltageMetric.LOWEST</code> Represents the lowest voltage value recorded during the monitoring period. <code>AmdSmiVoltageMetric.HIGHEST</code> Represents the highest voltage value recorded during the monitoring period.

Output: Voltage as integer in millivolts

Exceptions that can be thrown by `amdsmi_get_gpu_volt_metric` function:

- `AmdSmiLibraryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            voltage = amdsmi_get_gpu_volt_metric(
                device,
                AmdSmiVoltageType.VDDBOARD,
                AmdSmiVoltageMetric.AVERAGE
            )
            print(voltage)
except AmdSmiException as e:
    print(e)
```

9.1.56 `amdsmi_get_utilization_count`

Description: Get coarse/fine grain utilization counter of the specified device

Input parameters:

- `processor_handle` handle for the given device
- `counter_types` List of `AmdSmiUtilizationCounterType` counters requested

Output: List containing dictionaries with fields

Field	Description
timestamp	The timestamp when the counter is retrieved - Resolution: 1 ns
Dictionary for each counter	Subfield DescriptiontypeCounter that was requestedvalueValue gotten for utilization counter

Exceptions that can be thrown by `amdsmi_get_utilization_count` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            utilization = amdsmi_get_utilization_count(
                device,
                AmdSmiUtilizationCounterType.COARSE_GRAIN_GFX_ACTIVITY
            )
            print(utilization)
            utilization = amdsmi_get_utilization_count(
                device,
                [AmdSmiUtilizationCounterType.COARSE_GRAIN_GFX_ACTIVITY,
                AmdSmiUtilizationCounterType.COARSE_GRAIN_MEM_ACTIVITY,
                AmdSmiUtilizationCounterType.COARSE_DECODER_ACTIVITY,
                AmdSmiUtilizationCounterType.FINE_GRAIN_GFX_ACTIVITY,
                AmdSmiUtilizationCounterType.FINE_GRAIN_MEM_ACTIVITY,
                AmdSmiUtilizationCounterType.FINE_DECODER_ACTIVITY]
            )
            print(utilization)
except AmdSmiException as e:
    print(e)
```

9.1.57 `amdsmi_get_gpu_perf_level`

Description: Get the performance level of the device with provided device handle. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device

Output: Performance level as enum value of `dev_perf_level_t`

Exceptions that can be thrown by `amdsmi_get_gpu_perf_level` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            perf_level = amdsmi_get_gpu_perf_level(dev)
            print(perf_level)
except AmdSmiException as e:
    print(e)
```

9.1.58 amdsmi_set_gpu_perf_determinism_mode

Description: Enter performance determinism mode with provided device handle. It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device
- clkvalue softmax value for GFXCLK in MHz

Output: None

Exceptions that can be thrown by amdsmi_set_gpu_perf_determinism_mode function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_perf_determinism_mode(device, 1333)
except AmdSmiException as e:
    print(e)
```

9.1.59 amdsmi_get_gpu_process_isolation

Description: Get the status of the Process Isolation

Input parameters:

- processor_handle handle for the given device

Output: integer corresponding to isolation_status; 0 - disabled, 1 - enabled

Exceptions that can be thrown by amdsmi_get_gpu_process_isolation function:

- AmdSmiLibraryException
- AmdSmiRetryException

- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            isolate = amdsmi_get_gpu_process_isolation(device)
            print("Process Isolation Status: ", isolate)
except AmdSmiException as e:
    print(e)
```

9.1.60 amdsmi_set_gpu_process_isolation

Description: Enable/disable the system Process Isolation for the given device handle.

Input parameters:

- processor_handle handle for the given device
- pisolate the process isolation status to set. 0 is the process isolation disabled, and 1 is the process isolation enabled.

Output: None

Exceptions that can be thrown by amdsmi_set_gpu_process_isolation function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_process_isolation(device, 1)
except AmdSmiException as e:
    print(e)
```

9.1.61 amdsmi_clean_gpu_local_data

Description: Clear the SRAM data of the given device. This can be called between user logins to prevent information leak.

Input parameters:

- processor_handle handle for the given device

Output: None

Exceptions that can be thrown by amdsmi_clean_gpu_local_data function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_clean_gpu_local_data(device)
except AmdSmiException as e:
    print(e)
```

9.1.62 amdsmi_get_gpu_overdrive_level

Description: Get the overdrive percent associated with the device with provided device handle. It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device

Output: Overdrive percentage as integer

Exceptions that can be thrown by amdsmi_get_gpu_overdrive_level function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            od_level = amdsmi_get_gpu_overdrive_level(dev)
            print(od_level)
except AmdSmiException as e:
    print(e)
```

9.1.63 amdsmi_get_gpu_mem_overdrive_level

Description: Get the GPU memory clock overdrive percent associated with the device with provided device handle. It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device

Output: Overdrive percentage as integer

Exceptions that can be thrown by `amdsmi_get_gpu_mem_overdrive_level` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            od_level = amdsmi_get_gpu_mem_overdrive_level(dev)
            print(od_level)
except AmdSmiException as e:
    print(e)
```

9.1.64 `amdsmi_get_clk_freq`

Description: Get the list of possible system clock speeds of device for a specified clock type. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `clk_type` the type of clock for which the frequency is desired

Output: Dictionary with fields

Field	Description
<code>num_supported</code>	The number of supported frequencies
<code>current</code>	The current frequency index
<code>frequency</code>	List of frequencies, only the first <code>num_supported</code> frequencies are valid

Exceptions that can be thrown by `amdsmi_get_clk_freq` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_get_clk_freq(device, AmdSmiClkType.SYS)
```

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```
except AmdSmiException as e:
    print(e)
```

9.1.65 amdsmi_get_gpu_od_volt_info

Description: This function retrieves the voltage/frequency curve information. If the num_regions is 0 then the voltage curve is not supported. It is not supported on virtual machine guest.

Input parameters:

- processor_handle handle for the given device

Output: Dictionary with fields

Field	Description
curr_sclk_range	Subfield Descriptionlower_boundlower bound sclk rangeupper_boundupper bound sclk range
curr_mclk_range	Subfield Descriptionlower_boundlower bound mclk rangeupper_boundupper bound mclk range
sclk_freq_limit	Subfield Descriptionlower_boundlower bound sclk range limitupper_boundupper bound sclk range limit
mclk_freq_limit	Subfield Descriptionlower_boundlower bound mclk range limitupper_boundupper bound mclk range limit
curve. vc_points	List of voltage curve points
num_regions	The number of voltage curve regions

Exceptions that can be thrown by amdsmi_get_gpu_od_volt_info function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_get_gpu_od_volt_info(dev)
except AmdSmiException as e:
    print(e)
```

9.1.66 amdsmi_get_gpu_metrics_info

Description: This function retrieves the gpu metrics information. It is not supported on virtual machine guest

Input parameters:

- processor_handle handle for the given device

Output: Dictionary with fields

Field	Description
temperature_edge	Edge temperature value
temperature_hotspot	Hotspot (aka junction) temperature value
temperature_mem	Memory temperature value
temperature_vrgfx	vrgfx temperature value
temperature_vrsoc	vrsoc temperature value
temperature_vrmem	vrmem temperature value
average_gfx_activity	Average gfx activity
average_umc_activity	Average umc (Universal Memory Controller) activity
average_mm_activity	Average mm (multimedia) engine activity
average_socket_power	Average socket power
energy_accumulator	Energy accumulated with a 15.3 uJ resolution over 1ns
system_clock_counter	System clock counter
average_gfxclk_frequency	Average gfx clock frequency
average_socclk_frequency	Average soc clock frequency
average_uclk_frequency	Average uclk frequency
average_vclk0_frequency	Average vclk0 frequency
average_dclk0_frequency	Average dclk0 frequency
average_vclk1_frequency	Average vclk1 frequency
average_dclk1_frequency	Average dclk1 frequency
current_gfxclk	Current gfx clock
current_socclk	Current soc clock
current_uclk	Current uclk
current_vclk0	Current vclk0
current_dclk0	Current dclk0
current_vclk1	Current vclk1
current_dclk1	Current dclk1
throttle_status	Current throttle status
current_fan_speed	Current fan speed
pcie_link_width	PCIe link width (number of lanes)
pcie_link_speed	PCIe link speed in 0.1 GT/s (Giga Transfers per second)
padding	padding
gfx_activity_acc	gfx activity accumulated
mem_activity_acc	Memory activity accumulated
temperature_hbm	list of hbm temperatures
firmware_timestamp	timestamp from PMFW (10ns resolution)
voltage_soc	soc voltage
voltage_gfx	gfx voltage
voltage_mem	mem voltage
indep_throttle_status	ASIC independent throttle status (see drivers/gpu/drm/amd/pm/swsmu/inc/amdgpu_smu.h for b
current_socket_power	Current socket power (also known as instant socket power)
vcn_activity	List of VCN encode/decode engine utilization per AID
gfxclk_lock_status	Clock lock status. Bits 0:7 correspond to each gfx clock engine instance. Bits 0:5 for APU/AID
xgmi_link_width	XGMI bus width
xgmi_link_speed	XGMI bitrate
pcie_bandwidth_acc	PCIe accumulated bandwidth
pcie_bandwidth_inst	PCIe instantaneous bandwidth
pcie_l0_to_recov_count_acc	PCIe L0 to recovery state transition accumulated count
pcie_replay_count_acc	PCIe replay accumulated count
pcie_replay_rover_count_acc	PCIe replay rollover accumulated count

cont

Table 9.2 – continued from previous page

Field	Description
xgmi_read_data_acc	XGMI accumulated read data transfer size (KiloBytes)
xgmi_write_data_acc	XGMI accumulated write data transfer size (KiloBytes)
current_gfxclks	List of current gfx clock frequencies
current_socclks	List of current soc clock frequencies
current_vclk0s	List of current v0 clock frequencies
current_dclk0s	List of current d0 clock frequencies
pcie_nak_sent_count_acc	PCIe NAC sent count accumulated
pcie_nak_rcvd_count_acc	PCIe NAC received count accumulated
jpeg_activity	List of JPEG engine activity

Exceptions that can be thrown by `amdsmi_get_gpu_metrics_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_get_gpu_metrics_info(dev)
except AmdSmiException as e:
    print(e)
```

9.1.67 `amdsmi_get_gpu_pm_metrics_info`

Description: This function will retrieve the name and value for each item in the pm metrics table with the given processor handle.

Input parameters:

- `processor_handle` handle for the given device

Output: List containing dictionaries of pm metrics and their values

Field	Description
name	name of PM metric
value	value of pm metric

Exceptions that can be thrown by `amdsmi_get_gpu_pm_metrics_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            print(amdsmi_get_gpu_pm_metrics_info(device))
except AmdSmiException as e:
    print(e)

```

9.1.68 amdsmi_get_gpu_reg_table_info

Description: This function will retrieve register metrics table with provided device index and register type.

Input parameters:

- `processor_handle` handle for the given device
- `reg_type` register type

Output: List containing dictionaries of register metrics and their values

Field	Description
name	name of register metric
value	value of register metric

Exceptions that can be thrown by `amdsmi_get_gpu_reg_table_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            print(amdsmi_get_gpu_reg_table_info(device, AmdSmiRegType.PCIE))
except AmdSmiException as e:
    print(e)

```

9.1.69 amdsmi_get_gpu_od_volt_curve_regions

Description: This function will retrieve the current valid regions in the frequency/voltage space. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `num_regions` number of freq volt regions

Output: List containing a dictionary with fields for each freq volt region

Field	Description
freq_range	Subfield Descriptionlower_boundlower bound freq rangeupper_boundupper bound freq range
volt_range	Subfield Descriptionlower_boundlower bound volt rangeupper_boundupper bound volt range

Exceptions that can be thrown by `amdsmi_get_gpu_od_volt_curve_regions` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_get_gpu_od_volt_curve_regions(device, 3)
except AmdSmiException as e:
    print(e)
```

9.1.70 `amdsmi_get_gpu_power_profile_presets`

Description: Get the list of available preset power profiles and an indication of which profile is currently active. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_idx` number of freq volt regions

Output: Dictionary with fields

Field	Description
<code>available_profiles</code>	Which profiles are supported by this system
<code>current</code>	Which power profile is currently active
<code>num_profiles</code>	How many power profiles are available

Exceptions that can be thrown by `amdsmi_get_gpu_power_profile_presets` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
```

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```
if len(devices) == 0:
    print("No GPUs on machine")
else:
    for device in devices:
        amdsmi_get_gpu_power_profile_presets(device, 0)
except AmdSmiException as e:
    print(e)
```

9.1.71 amdsmi_gpu_counter_group_supported

Description: Tell if an event group is supported by a given device. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` device which to query
- `event_group` event group being checked for support

Output: None

Exceptions that can be thrown by `amdsmi_gpu_counter_group_supported` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_gpu_counter_group_supported(device, AmdSmiEventGroup.XGMI)
except AmdSmiException as e:
    print(e)
```

9.1.72 amdsmi_gpu_create_counter

Description: Creates a performance counter object

Input parameters:

- `processor_handle` device which to query
- `event_type` event group being checked for support

Output: An event handle of the newly created performance counter object

Exceptions that can be thrown by `amdsmi_gpu_create_counter` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            event_handle = amdsmi_gpu_create_counter(device, AmdSmiEventGroup.XGMI)
except AmdSmiException as e:
    print(e)

```

9.1.73 amdsmi_gpu_destroy_counter

Description: Destroys a performance counter object

Input parameters:

- `event_handle` event handle of the performance counter object

Output: None

Exceptions that can be thrown by `amdsmi_gpu_destroy_counter` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            event_handle = amdsmi_gpu_create_counter(device, AmdSmiEventGroup.XGMI)
            amdsmi_gpu_destroy_counter(event_handle)
except AmdSmiException as e:
    print(e)

```

9.1.74 amdsmi_gpu_control_counter

Description: Issue performance counter control commands. It is not supported on virtual machine guest

Input parameters:

- `event_handle` event handle of the performance counter object
- `counter_command` command being passed to counter as `AmdSmiCounterCommand`

Output: None

Exceptions that can be thrown by `amdsmi_gpu_control_counter` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            event_handle = amdsmi_gpu_create_counter(device, AmdSmiEventType.XGMI_1_
↳REQUEST_TX)
            amdsmi_gpu_control_counter(event_handle, AmdSmiCounterCommand.CMD_START)
except AmdSmiException as e:
    print(e)
```

9.1.75 amdsmi_gpu_read_counter

Description: Read the current value of a performance counter

Input parameters:

- event_handle event handle of the performance counter object

Output: Dictionary with fields

Field	Description
value	Counter value
time_enabled	Time that the counter was enabled in nanoseconds
time_running	Time that the counter was running in nanoseconds

Exceptions that can be thrown by amdsmi_gpu_read_counter function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            event_handle = amdsmi_gpu_create_counter(device, AmdSmiEventType.XGMI_1_
↳REQUEST_TX)
            amdsmi_gpu_read_counter(event_handle)
except AmdSmiException as e:
    print(e)
```

9.1.76 amdsmi_get_gpu_available_counters

Description: Get the number of currently available counters. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `event_group` event group being checked as `AmdSmiEventGroup`

Output: Number of available counters for the given device of the inputted event group

Exceptions that can be thrown by `amdsmi_get_gpu_available_counters` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            available_counters = amdsmi_get_gpu_available_counters(device, ↵
↵AmdSmiEventGroup.XGMI)
            print(available_counters)
except AmdSmiException as e:
    print(e)
```

9.1.77 amdsmi_set_gpu_perf_level

Description: Set a desired performance level for given device. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `perf_level` performance level being set as `AmdSmiDevPerfLevel`

Output: None

Exceptions that can be thrown by `amdsmi_set_gpu_perf_level` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_perf_level(device, AmdSmiDevPerfLevel.STABLE_PEAK)
```

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```
except AmdSmiException as e:  
    print(e)
```

9.1.78 amdsmi_reset_gpu

Description: Reset the gpu associated with the device with provided device handle It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device

Output: None

Exceptions that can be thrown by `amdsmi_reset_gpu` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:  
    devices = amdsmi_get_processor_handles()  
    if len(devices) == 0:  
        print("No GPUs on machine")  
    else:  
        for device in devices:  
            amdsmi_reset_gpu(device)  
except AmdSmiException as e:  
    print(e)
```

9.1.79 amdsmi_set_gpu_fan_speed

Description: Set the fan speed for the specified device with the provided speed, in RPMs. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_idx` sensor index as integer
- `fan_speed` the speed to which the function will attempt to set the fan

Output: None

Exceptions that can be thrown by `amdsmi_set_gpu_fan_speed` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_fan_speed(device, 0, 1333)
except AmdSmiException as e:
    print(e)

```

9.1.80 amdsmi_reset_gpu_fan

Description: Reset the fan to automatic driver control. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `sensor_idx` sensor index as integer

Output: None

Exceptions that can be thrown by `amdsmi_reset_gpu_fan` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_reset_gpu_fan(device, 0)
except AmdSmiException as e:
    print(e)

```

9.1.81 amdsmi_set_clk_freq

Description: Control the set of allowed frequencies that can be used for the specified clock. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `clk_type` the type of clock for which the set of frequencies will be modified as `AmdSmiClkType`
- `freq_bitmask` bitmask indicating the indices of the frequencies that are to be enabled (1) and disabled (0). Only the lowest `::amdsmi_frequencies_t.num_supported` bits of this mask are relevant.

Output: None

Exceptions that can be thrown by `amdsmi_set_clk_freq` function:

- `AmdSmiLibraryException`

- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            freq_bitmask = 0
            amdsmi_set_clk_freq(device, AmdSmiClkType.GFX, freq_bitmask)
except AmdSmiException as e:
    print(e)
```

9.1.82 amdsmi_get_soc_pstate

Description: Get dpm policy information.

Input parameters:

- processor_handle handle for the given device
- policy_id the policy id to set.

Output: Dictionary with fields

Field	Description
num_supported	total number of supported policies
current_id	current policy id
policies	list of dictionaries containing possible policies

Exceptions that can be thrown by amdsmi_get_soc_pstate function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            dpm_policies = amdsmi_get_soc_pstate(device)
            print(dpm_policies)
except AmdSmiException as e:
    print(e)
```

9.1.83 amdsmi_set_soc_pstate

Description: Set the dpm policy to corresponding policy_id. Typically following: 0(default),1,2,3

Input parameters:

- processor_handle handle for the given device
- policy_id the policy id to set.

Output: None

Exceptions that can be thrown by amdsmi_set_soc_pstate function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_soc_pstate(device, 0)
except AmdSmiException as e:
    print(e)
```

9.1.84 amdsmi_set_xgmi_plpd

Description: Set the xgmi per-link power down policy parameter for the processor

Input parameters:

- processor_handle handle for the given device
- policy_id the xgmi plpd id to set.

Output: None

Exceptions that can be thrown by amdsmi_set_xgmi_plpd function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_xgmi_plpd(device, 0)
except AmdSmiException as e:
    print(e)
```

9.1.85 amdsmi_get_xgmi_plpd

Description: Get the xgmi per-link power down policy parameter for the processor

Input parameters:

- `processor_handle` handle for the given device

Output: Dict containing information about xgmi per-link power down policy

Field	Description
<code>num_supported</code>	The number of supported policies
<code>current_id</code>	The current policy index
<code>plpds</code>	List of policies.

Exceptions that can be thrown by `amdsmi_get_xgmi_plpd` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            xgmi_plpd = amdsmi_get_xgmi_plpd(device)
            print(xgmi_plpd)
except AmdSmiException as e:
    print(e)
```

9.1.86 amdsmi_set_gpu_overdrive_level

Description: **deprecated** Set the overdrive percent associated with the device with provided device handle with the provided value. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device
- `overdrive_value` value to which the overdrive level should be set

Output: None

Exceptions that can be thrown by `amdsmi_set_gpu_overdrive_level` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_overdrive_level(device, 0)
except AmdSmiException as e:
    print(e)

```

9.1.87 amdsmi_get_gpu_ecc_count

Description: Retrieve the error counts for a GPU block. It is not supported on virtual machine guest

See [RAS Error Count sysfs Interface \(AMDGPU RAS Support - Linux Kernel documentation\)](#) to learn how these error counts are accessed.

Input parameters:

- `processor_handle` handle for the given device
- `block` The block for which error counts should be retrieved

Output: Dict containing information about error counts

Field	Description
<code>correctable_count</code>	Count of correctable errors
<code>uncorrectable_count</code>	Count of uncorrectable errors
<code>deferred_count</code>	Count of deferred errors

Exceptions that can be thrown by `amdsmi_get_gpu_ecc_count` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            ecc_count = amdsmi_get_gpu_ecc_count(device, AmdSmiGpuBlock.UMC)
            print(ecc_count)
except AmdSmiException as e:
    print(e)

```

9.1.88 amdsmi_get_gpu_ecc_enabled

Description: Retrieve the enabled ECC bit-mask. It is not supported on virtual machine guest

See [RAS Error Count sysfs Interface \(AMDGPU RAS Support - Linux Kernel documentation\)](#) to learn how these error counts are accessed.

Input parameters:

- `processor_handle` handle for the given device

Output: Enabled ECC bit-mask

Exceptions that can be thrown by `amdsmi_get_gpu_ecc_enabled` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            enabled = amdsmi_get_gpu_ecc_enabled(device)
            print(enabled)
except AmdSmiException as e:
    print(e)
```

9.1.89 amdsmi_get_gpu_ecc_status

Description: Retrieve the ECC status for a GPU block. It is not supported on virtual machine guest

See [RAS Error Count sysfs Interface \(AMDGPU RAS Support - Linux Kernel documentation\)](#) to learn how these error counts are accessed.

Input parameters:

- `processor_handle` handle for the given device
- `block` The block for which ECC status should be retrieved

Output: ECC status for a requested GPU block

Exceptions that can be thrown by `amdsmi_get_gpu_ecc_status` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
```

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```

else:
    for device in devices:
        status = amdsmi_get_gpu_ecc_status(device, AmdSmiGpuBlock.UMC)
        print(status)
except AmdSmiException as e:
    print(e)

```

9.1.90 amdsmi_status_code_to_string

Description: Get a description of a provided AMDSMI error status

Input parameters:

- status The error status for which a description is desired

Output: String description of the provided error code

Exceptions that can be thrown by amdsmi_status_code_to_string function:

- AmdSmiParameterException

Example:

```

try:
    status_str = amdsmi_status_code_to_string(ctypes.c_uint32(0))
    print(status_str)
except AmdSmiException as e:
    print(e)

```

9.1.91 amdsmi_get_gpu_compute_process_info

Description: Get process information about processes currently using GPU

Input parameters: None

Output: List of python dicts each containing a process information

Field	Description
process_id	Process ID
pasid	PASID (Not working in ROCm 6.4+, Deprecated in 7.0)
vram_usage	VRAM usage
sdma_usage	SDMA usage in microseconds
cu_occupancy	Compute Unit usage in percents

Exceptions that can be thrown by amdsmi_get_gpu_compute_process_info function:

- AmdSmiLibraryException
- AmdSmiRetryException

Example:

```

try:
    procs = amdsmi_get_gpu_compute_process_info()
    for proc in procs:
        print(proc)

```

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```
except AmdSmiException as e:
    print(e)
```

9.1.92 amdsmi_get_gpu_compute_process_info_by_pid

Description: Get process information about processes currently using GPU

Input parameters:

- `pid` The process ID for which process information is being requested

Output: Dict containing a process information

Field	Description
<code>process_id</code>	Process ID
<code>pasid</code>	PASID (Not working in ROCm 6.4+, deprecating in 7.0)
<code>vram_usage</code>	VRAM usage
<code>sdma_usage</code>	SDMA usage in microseconds
<code>cu_occupancy</code>	Compute Unit usage in percents

Exceptions that can be thrown by `amdsmi_get_gpu_compute_process_info_by_pid` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    pid = 0 # << valid pid here
    proc = amdsmi_get_gpu_compute_process_info_by_pid(pid)
    print(proc)
except AmdSmiException as e:
    print(e)
```

9.1.93 amdsmi_get_gpu_compute_process_gpus

Description: Get the device indices currently being used by a process

Input parameters:

- `pid` The process id of the process for which the number of gpus currently being used is requested

Output: List of indices of devices currently being used by the process

Exceptions that can be thrown by `amdsmi_get_gpu_compute_process_gpus` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    pid = 0 # << valid pid here
    indices = amdsmi_get_gpu_compute_process_gpus(pid)
    print(indices)
except AmdSmiException as e:
    print(e)

```

9.1.94 amdsmi_gpu_xgmi_error_status

Description: Retrieve the XGMI error status for a device. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device

Output: XGMI error status for a requested device

Exceptions that can be thrown by `amdsmi_gpu_xgmi_error_status` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            status = amdsmi_gpu_xgmi_error_status(device)
            print(status)
except AmdSmiException as e:
    print(e)

```

9.1.95 amdsmi_reset_gpu_xgmi_error

Description: Reset the XGMI error status for a device. It is not supported on virtual machine guest

Input parameters:

- `processor_handle` handle for the given device

Output: None

Exceptions that can be thrown by `amdsmi_reset_gpu_xgmi_error` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_reset_gpu_xgmi_error(device)
except AmdSmiException as e:
    print(e)
```

9.1.96 amdsmi_get_gpu_vendor_name

Description: Returns the device vendor name

Input parameters:

- processor_handle device which to query

Output: device vendor name

Exceptions that can be thrown by amdsmi_get_gpu_vendor_name function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vendor_name = amdsmi_get_gpu_vendor_name(device)
            print(vendor_name)
except AmdSmiException as e:
    print(e)
```

9.1.97 amdsmi_get_gpu_id

Description: Get the device id associated with the device with provided device handler

Input parameters:

- processor_handle device which to query

Output: device id

Exceptions that can be thrown by amdsmi_get_gpu_id function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            dev_id = amdsmi_get_gpu_id(device)
            print(dev_id)
except AmdSmiException as e:
    print(e)

```

9.1.98 amdsmi_get_gpu_vram_vendor

Description: Get the vram vendor string of a gpu device.

Input parameters:

- processor_handle device which to query

Output: vram vendor

Exceptions that can be thrown by amdsmi_get_gpu_vram_vendor function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            vram_vendor = amdsmi_get_gpu_vram_vendor(device)
            print(vram_vendor)
except AmdSmiException as e:
    print(e)

```

9.1.99 amdsmi_get_gpu_subsystem_id

Description: Get the subsystem device id associated with the device with provided device handle.

Input parameters:

- processor_handle device which to query

Output: subsystem device id

Exceptions that can be thrown by amdsmi_get_gpu_subsystem_id function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            id = amdsmi_get_gpu_subsystem_id(device)
            print(id)
except AmdSmiException as e:
    print(e)
```

9.1.100 amdsmi_get_gpu_subsystem_name

Description: Get the name string for the device subsystem

Input parameters:

- processor_handle device which to query

Output: device subsystem

Exceptions that can be thrown by amdsmi_get_gpu_subsystem_name function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            subsystem_name = amdsmi_get_gpu_subsystem_name(device)
            print(subsystem_name)
except AmdSmiException as e:
    print(e)
```

9.1.101 amdsmi_topo_get_numa_node_number

Description: Retrieve the NUMA CPU node number for a device

Input parameters:

- processor_handle device which to query

Output: node number of NUMA CPU for the device

Exceptions that can be thrown by amdsmi_topo_get_numa_node_number function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            node_number = amdsmi_topo_get_numa_node_number()
            print(node_number)
except AmdSmiException as e:
    print(e)

```

9.1.102 amdsmi_topo_get_link_weight

Description: Retrieve the weight for a connection between 2 GPUs.

Input parameters:

- `processor_handle_src` the source device handle
- `processor_handle_dest` the destination device handle

Output: the weight for a connection between 2 GPUs

Exceptions that can be thrown by `amdsmi_topo_get_link_weight` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        processor_handle_src = devices[0]
        processor_handle_dest = devices[1]
        weight = amdsmi_topo_get_link_weight(processor_handle_src, processor_handle_dest)
        print(weight)
except AmdSmiException as e:
    print(e)

```

9.1.103 amdsmi_get_minmax_bandwidth_between_processors

Description: Retrieve minimal and maximal io link bandwidth between 2 GPUs.

Input parameters:

- `processor_handle_src` the source device handle
- `processor_handle_dest` the destination device handle

Output: Dictionary with fields:

Field	Description
<code>min_bandwidth</code>	minimal bandwidth for the connection
<code>max_bandwidth</code>	maximal bandwidth for the connection

Exceptions that can be thrown by `amdsmi_get_minmax_bandwidth_between_processors` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        processor_handle_src = devices[0]
        processor_handle_dest = devices[1]
        bandwidth = amdsmi_get_minmax_bandwidth_between_processors(processor_handle_src,
↪ processor_handle_dest)
        print(bandwidth['min_bandwidth'])
        print(bandwidth['max_bandwidth'])
except AmdSmiException as e:
    print(e)
```

9.1.104 `amdsmi_get_link_metrics`

Description: Returns XGMI link metrics information for the given GPU.

Input parameters:

- `processor_handle` — The device handle for which to query link metrics.

Output: Dictionary with fields

Field	Description
<code>num_links</code>	Number of XGMI links reported
<code>bit_rate</code>	XGMI link bit rate (in appropriate units, e.g., Gbps)
<code>max_bandwi</code>	Maximum XGMI bandwidth (in appropriate units, e.g., GB/s)
<code>links</code>	List of dictionaries, one per XGMI link, each with:
<code>bdf</code>	BDF string for the destination
<code>link_type</code>	The connection type as an int. This should be translated according to the enum <code>amdsmi_link_type_t</code> . Refer to the example below for more details.
<code>read</code>	Accumulated read data for this link (e.g., KB)
<code>write</code>	Accumulated write data for this link (e.g., KB)

Exceptions that can be thrown by `amdsmi_get_link_metrics` function:

- `AmdSmiLibraryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            link_metrics = amdsmi_get_link_metrics(device)
            print(link_metrics['bit_rate'])
            print(link_metrics['max_bandwidth'])
            for idx, link in enumerate(link_metrics['links']):
                print(f"{idx}: {link['bdf']}, {link['read']} KB, {link['write']} KB")
                if link_type['link_type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_INTERNAL:
                    print('internal')
                if link_type['link_type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_PCIE:
                    print('pcie')
                if link_type['link_type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_XGMI:
                    print('xgmi')
                if link_type['link_type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_NOT_
↪APPLICABLE:
                    print('not applicable')
                if link_type['link_type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_UNKNOWN:
                    print('unknown')
except AmdSmiException as e:
    print(e)

```

9.1.105 amdsmi_topo_get_link_type

Description: Retrieve the hops and the connection type between 2 GPUs

Input parameters:

- processor_handle_src the source device handle
- processor_handle_dest the destination device handle

Output: Dictionary with fields:

Field	Description
hops	Number of hops
type	The connection type as an int. This should be translated according to the enum amdsmi_link_type_t. Refer to the example below for more details.

Exceptions that can be thrown by amdsmi_topo_get_link_type function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:

```

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```

    print("No GPUs on machine")
else:
    processor_handle_src = devices[0]
    processor_handle_dest = devices[1]
    link_type = amdsmi_topo_get_link_type(processor_handle_src, processor_handle_
↪dest)
    print(link_type['hops'])
    if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_INTERNAL:
        print('internal')
    if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_PCIE:
        print('pcie')
    if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_XGMI:
        print('xgmi')
    if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_NOT_APPLICABLE:
        print('not applicable')
    if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_UNKNOWN:
        print('unknown')
except AmdSmiException as e:
    print(e)

```

9.1.106 amdsmi_get_P2P_status

Description: Retrieve the connection type and P2P capabilities between 2 GPUs

Input parameters:

- processor_handle_src the source device handle
- processor_handle_dest the destination device handle

Output: Dictionary with fields:

Field	Description
type	The connection type as an int. This should be translated according to the enum amdsmi_link_type_t. Refer to the example below for more details.
cap	Subfield Description is_iolink_coherent1 == True; 0 == False; Uint_max = Undefinedis_iolink_atomics_32bitSupports 32bit atomicsis_iolink_atomics_64bitSupports 64bit atomicsis_iolink_dmaSupports DMAis_iolink_bi_directionalIs the IOLink Bidirectional

Exceptions that can be thrown by amdsmi_get_P2P_status function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:

```

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```

processor_handle_src = devices[0]
processor_handle_dest = devices[1]
link_type = amdsmi_get_P2P_status(processor_handle_src, processor_handle_dest)
if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_INTERNAL:
    print('internal')
if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_PCIE:
    print('pcie')
if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_XGMI:
    print('xgmi')
if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_NOT_APPLICABLE:
    print('not applicable')
if link_type['type'] == AmdSmiLinkType.AMDSMI_LINK_TYPE_UNKNOWN:
    print('unknown')
print(link_type['caps'])
except AmdSmiException as e:
    print(e)

```

9.1.107 amdsmi_is_P2P_accessible

Description: Return P2P availability status between 2 GPUs

Input parameters:

- processor_handle_src the source device handle
- processor_handle_dest the destination device handle

Output: P2P availability status between 2 GPUs

Exceptions that can be thrown by amdsmi_is_P2P_accessible function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        processor_handle_src = devices[0]
        processor_handle_dest = devices[1]
        accessible = amdsmi_is_P2P_accessible(processor_handle_src, processor_handle_
↪dest)
        print(accessible)
except AmdSmiException as e:
    print(e)

```

9.1.108 amdsmi_get_gpu_compute_partition

Description: Get the compute partition from the given GPU

Input parameters:

- `processor_handle` the device handle

Output: String of the partition type

Exceptions that can be thrown by `amdsmi_get_gpu_compute_partition` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            compute_partition_type = amdsmi_get_gpu_compute_partition(device)
            print(compute_partition_type)
except AmdSmiException as e:
    print(e)
```

9.1.109 amdsmi_set_gpu_compute_partition

Description: Set the compute partition to the given GPU. This function does not allow any concurrent operations. Device must be idle and have no workloads when performing set partition operations.

Input parameters:

- `processor_handle` the device handle
- `compute_partition` the type of `compute_partition` to set

Output: String of the partition type

Exceptions that can be thrown by `amdsmi_set_gpu_compute_partition` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    compute_partition = AmdSmiComputePartitionType.SPX
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            amdsmi_set_gpu_compute_partition(device, compute_partition)
```

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```
except AmdSmiException as e:
    print(e)
```

9.1.110 amdsmi_get_gpu_memory_partition

Description: Get the memory partition from the given GPU

Input parameters:

- `processor_handle` the device handle

Output: String of the partition type

Exceptions that can be thrown by `amdsmi_get_gpu_memory_partition` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            memory_partition_type = amdsmi_get_gpu_memory_partition(device)
            print(memory_partition_type)
except AmdSmiException as e:
    print(e)
```

9.1.111 amdsmi_set_gpu_memory_partition

Description: Set the memory partition to the given GPU. This function does not allow any concurrent operations. Devices must be idle and have no workloads when performing set partition operations.

Input parameters:

- `processor_handle` the device handle
- `memory_partition` the type of memory_partition to set

Output: String of the partition type

Exceptions that can be thrown by `amdsmi_set_gpu_memory_partition` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    memory_partition = AmdSmiMemoryPartitionType.NPS1
    devices = amdsmi_get_processor_handles()
```

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```

if len(devices) == 0:
    print("No GPUs on machine")
else:
    for device in devices:
        amdsmi_set_gpu_memory_partition(device, memory_partition)
except AmdSmiException as e:
    print(e)

```

9.1.112 amdsmi_get_gpu_accelerator_partition_profile

Note: CURRENTLY HARDCODED TO RETURN EMPTY VALUES

Description: Get partition information for target device

Input parameters:

- `processor_handle` the device handle

Output: Dictionary with fields:

Field	Description
<code>partition_id</code>	ID of the partition on the GPU provided
<code>partition_profile</code>	Dict containing partition data (TBD)

Exceptions that can be thrown by `amdsmi_get_gpu_accelerator_partition_profile` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```

try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            partition_id = amdsmi_get_gpu_accelerator_partition_profile(device)[
↪ "partition_id"]
            print(partition_id)
except AmdSmiException as e:
    print(e)

```

9.1.113 amdsmi_get_xgmi_info

Description: Returns XGMI information for the GPU.

Input parameters:

- `processor_handle` device handle

Output: Dictionary with fields:

Field	Description
xgmi_lanes	xgmi lanes
xgmi_hive_id	xgmi hive id
xgmi_node_id	xgmi node id
index	index

Exceptions that can be thrown by `amdsmi_get_xgmi_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            xgmi_info = amdsmi_get_xgmi_info(device)
            print(xgmi_info['xgmi_lanes'])
            print(xgmi_info['xgmi_hive_id'])
            print(xgmi_info['xgmi_node_id'])
            print(xgmi_info['index'])
except AmdSmiException as e:
    print(e)
```

9.1.114 amdsmi_get_link_topology_nearest

Description: Retrieve the set of GPUs that are nearest to a given device at a specific interconnectivity level.

Input parameters:

- `processor_handle` The identifier of the given device.
- `link_type` The `AmdSmiLinkType` level to search for nearest devices

Output: Dictionary holding the following fields.

- `processor_list` list of all nearest device handlers found

Exceptions that can be thrown by `amdsmi_get_link_topology_nearest` function:

- `AmdSmiLibraryException`

Example:

```
try:
    amdsmi_init()

    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs found on machine")
        exit()
```

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```

else:
    print(amdsmi_get_gpu_device_uuid(devices[0]))

nearest_gpus = amdsmi_get_link_topology_nearest(devices[0], AmdSmiLinkType.AMDSMI_
↳LINK_TYPE_PCIE)
if (len(nearest_gpus['processor_list'])) == 0:
    print("No nearest GPUs found on machine")
else:
    print("Nearest GPUs")
    for gpu in nearest_gpus['processor_list']:
        print(amdsmi_get_gpu_device_uuid(gpu))

except AmdSmiException as e:
    print(e)
finally:
    try:
        amdsmi_shut_down()
    except AmdSmiException as e:
        print(e)

```

9.1.115 amdsmi_get_gpu_virtualization_mode

Description: Retrieve the virtualization mode for the selected GPU.

Input parameters:

- `processor_handle` The identifier of the given device.

Output: Dictionary holding the following fields.

- `mode` `AmdSmiVirtualizationMode`; an `IntEnum` denoting the possible virtualization modes
Field | Description
—|— UNKNOWN | Virtualization mode not detected BAREMETAL | Baremetal platform detected HOST | Host/Hypervisor platform detected GUEST | Guest/Virtual Machine detected PASSTHROUGH | GPU Passthrough mode detected

Exceptions that can be thrown by `amdsmi_get_gpu_virtualization_mode` function:

- `AmdSmiLibraryException`

Example:

```

try:
    device_handles = amdsmi_interface.amdsmi_get_processor_handles()
    for dev in device_handles:
        virtualization_info = amdsmi_interface.amdsmi_get_gpu_virtualization_mode(dev)
        print(virtualization_info['mode'])
except AmdSmiException as e:
    print(e)

```

9.1.116 amdsmi_get_cpu_affinity_with_scope

Description: Returns list of bitmask information for the given GPU.

Input parameters:

- `processor_handle` device which to query

Output: List with fields

Field	Description
array_size	array size = (num of sockets * num of cores)/ size of 64-bit
scope	enum value for numa or socket affinity

Exceptions that can be thrown by `amdsmi_get_gpu_vram_info` function:

- `AmdSmiLibraryException`
- `AmdSmiRetryException`
- `AmdSmiParameterException`

Example:

```
try:
    devices = amdsmi_get_processor_handles()
    if len(devices) == 0:
        print("No GPUs on machine")
    else:
        for device in devices:
            bitmask = amdsmi_get_cpu_affinity_with_scope(device)
            print(bitmask['size'])
except AmdSmiException as e:
    print(e)
```

9.2 CPU APIs

9.2.1 amdsmi_get_processor_info

Note: CURRENTLY HARDCODED TO RETURN EMPTY VALUES

Description: Return processor name

Input parameters: `processor_handle` processor handle

Output: Processor name

Exceptions that can be thrown by `amdsmi_get_processor_info` function:

- `AmdSmiLibraryException`

Example:

```
try:
    processor_handles = amdsmi_get_processor_handles()
    if len(processor_handles) == 0:
        print("No processors on machine")
    else:
        for processor in processor_handles:
            print(amdsmi_get_processor_info(processor))
except AmdSmiException as e:
    print(e)
```

9.2.2 amdsmi_get_cpu_hsmp_proto_ver

Description: Get the hsmp protocol version.

Output: amdsmi hsmp protocol version

Exceptions that can be thrown by amdsmi_get_cpu_hsmp_proto_ver function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            version = amdsmi_get_cpu_hsmp_proto_ver(processor)
            print(version)
except AmdSmiException as e:
    print(e)
```

9.2.3 amdsmi_get_threads_per_core

Description: Get number of threads per core.

Output: cpu family

Exceptions that can be thrown by amdsmi_get_cpu_family function:

- AmdSmiLibraryException

Example:

```
try:
    threads_per_core = amdsmi_get_threads_per_core()
    print(threads_per_core)
except AmdSmiException as e:
    print(e)
```

9.2.4 amdsmi_get_cpu_hsmp_driver_version

Description: Get the HSMP Driver version.

Output: amdsmi HSMP Driver version

Exceptions that can be thrown by amdsmi_get_cpu_hsmp_driver_version function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
```

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```

        version = amdsmi_get_cpu_hsmp_driver_version(processor)
        print(version['major'])
        print(version['minor'])
except AmdSmiException as e:
    print(e)

```

9.2.5 amdsmi_get_cpu_smu_fw_version

Description: Get the SMU Firmware version.

Output: amdsmi SMU Firmware version

Exceptions that can be thrown by amdsmi_get_cpu_smu_fw_version function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            version = amdsmi_get_cpu_smu_fw_version(processor)
            print(version['debug'])
            print(version['minor'])
            print(version['major'])
except AmdSmiException as e:
    print(e)

```

9.2.6 amdsmi_get_cpu_prochot_status

Description: Get the CPU's prochot status.

Output: amdsmi cpu prochot status

Exceptions that can be thrown by amdsmi_get_cpu_prochot_status function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            prochot = amdsmi_get_cpu_prochot_status(processor)
            print(prochot)
except AmdSmiException as e:
    print(e)

```

9.2.7 amdsmi_get_cpu_fclk_mclk

Description: Get the Data fabric clock and Memory clock in MHz.

Output: amdsmi data fabric clock and memory clock

Exceptions that can be thrown by amdsmi_get_cpu_fclk_mclk function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            clk = amdsmi_get_cpu_fclk_mclk(processor)
            for fclk, mclk in clk.items():
                print(fclk)
                print(mclk)
except AmdSmiException as e:
    print(e)
```

9.2.8 amdsmi_get_cpu_cclk_limit

Description: Get the core clock in MHz.

Output: amdsmi core clock

Exceptions that can be thrown by amdsmi_get_cpu_cclk_limit function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            cclk_limit = amdsmi_get_cpu_cclk_limit(processor)
            print(cclk_limit)
except AmdSmiException as e:
    print(e)
```

9.2.9 amdsmi_get_cpu_socket_current_active_freq_limit

Description: Get current active frequency limit of the socket.

Output: amdsmi frequency value in MHz and frequency source name

Exceptions that can be thrown by amdsmi_get_cpu_socket_current_active_freq_limit function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpsocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            freq_limit = amdsmi_get_cpu_socket_current_active_freq_limit(processor)
            for freq, src in freq_limit.items():
                print(freq)
                print(src)
except AmdSmiException as e:
    print(e)

```

9.2.10 amdsmi_get_cpu_socket_freq_range

Description: Get socket frequency range

Output: amdsmi maximum frequency and minimum frequency

Exceptions that can be thrown by amdsmi_get_cpu_socket_freq_range function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpsocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            freq_range = amdsmi_get_cpu_socket_freq_range(processor)
            for fmax, fmin in freq_range.items():
                print(fmax)
                print(fmin)
except AmdSmiException as e:
    print(e)

```

9.2.11 amdsmi_get_cpu_core_current_freq_limit

Description: Get socket frequency limit of the core

Output: amdsmi frequency

Exceptions that can be thrown by amdsmi_get_cpu_core_current_freq_limit function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpucore_handles()
    if len(processor_handles) == 0:
        print("No CPU cores on machine")
    else:
        for processor in processor_handles:

```

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```
        freq_limit = amdsmi_get_cpu_core_current_freq_limit(processor)
        print(freq_limit)
except AmdSmiException as e:
    print(e)
```

9.2.12 amdsmi_get_cpu_socket_power

Description: Get the socket power.

Output: amdsmi socket power

Exceptions that can be thrown by amdsmi_get_cpu_socket_power function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            sock_power = amdsmi_get_cpu_socket_power(processor)
            print(sock_power)
except AmdSmiException as e:
    print(e)
```

9.2.13 amdsmi_get_cpu_socket_power_cap

Description: Get the socket power cap.

Output: amdsmi socket power cap

Exceptions that can be thrown by amdsmi_get_cpu_socket_power_cap function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            sock_power = amdsmi_get_cpu_socket_power_cap(processor)
            print(sock_power)
except AmdSmiException as e:
    print(e)
```

9.2.14 amdsmi_get_cpu_socket_power_cap_max

Description: Get the socket power cap max.

Output: amdsmi socket power cap max

Exceptions that can be thrown by amdsmi_get_cpu_socket_power_cap_max function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            sock_power = amdsmi_get_cpu_socket_power_cap_max(processor)
            print(sock_power)
except AmdSmiException as e:
    print(e)
```

9.2.15 amdsmi_get_cpu_pwr_svi_telemetry_all_rails

Description: Get the SVI based power telemetry for all rails.

Output: amdsmi svi based power value

Exceptions that can be thrown by amdsmi_get_cpu_pwr_svi_telemetry_all_rails function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            power = amdsmi_get_cpu_pwr_svi_telemetry_all_rails(processor)
            print(power)
except AmdSmiException as e:
    print(e)
```

9.2.16 amdsmi_set_cpu_socket_power_cap

Description: Set the power cap value for a given socket.

Input: amdsmi socket power cap value

Exceptions that can be thrown by amdsmi_set_cpu_socket_power_cap function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            power = amdsmi_set_cpu_socket_power_cap(processor, 1000)
except AmdSmiException as e:
    print(e)

```

9.2.17 amdsmi_set_cpu_pwr_efficiency_mode

Description: Set the power efficiency profile policy.

Input: mode(0, 1, or 2)

Exceptions that can be thrown by amdsmi_set_cpu_pwr_efficiency_mode function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            policy = amdsmi_set_cpu_pwr_efficiency_mode(processor, 0)
except AmdSmiException as e:
    print(e)

```

9.2.18 amdsmi_get_cpu_core_boostlimit

Description: Get boost limit of the cpu core

Output: amdsmi frequency

Exceptions that can be thrown by amdsmi_get_cpu_core_boostlimit function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpucore_handles()
    if len(processor_handles) == 0:
        print("No CPU cores on machine")
    else:
        for processor in processor_handles:
            boost_limit = amdsmi_get_cpu_core_boostlimit(processor)
            print(boost_limit)
except AmdSmiException as e:
    print(e)

```

9.2.19 amdsmi_get_cpu_socket_c0_residency

Description: Get the cpu socket C0 residency.

Output: amdsmi C0 residency value

Exceptions that can be thrown by amdsmi_get_cpu_socket_c0_residency function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            c0_residency = amdsmi_get_cpu_socket_c0_residency(processor)
            print(c0_residency)
except AmdSmiException as e:
    print(e)
```

9.2.20 amdsmi_set_cpu_core_boostlimit

Description: Set the cpu core boost limit.

Output: amdsmi boostlimit value

Exceptions that can be thrown by amdsmi_set_cpu_core_boostlimit function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpucore_handles()
    if len(processor_handles) == 0:
        print("No CPU cores on machine")
    else:
        for processor in processor_handles:
            boost_limit = amdsmi_set_cpu_core_boostlimit(processor, 1000)
except AmdSmiException as e:
    print(e)
```

9.2.21 amdsmi_set_cpu_socket_boostlimit

Description: Set the cpu socket boost limit.

Input: amdsmi boostlimit value

Exceptions that can be thrown by amdsmi_set_cpu_socket_boostlimit function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
```

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```
if len(processor_handles) == 0:
    print("No CPU sockets on machine")
else:
    for processor in processor_handles:
        boost_limit = amdsmi_set_cpu_socket_boostlimit(processor, 1000)
except AmdSmiException as e:
    print(e)
```

9.2.22 amdsmi_get_cpu_ddr_bw

Description: Get the CPU DDR Bandwidth.

Output: amdsmi ddr bandwidth data

Exceptions that can be thrown by amdsmi_get_cpu_ddr_bw function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            ddr_bw = amdsmi_get_cpu_ddr_bw(processor)
            print(ddr_bw['max_bw'])
            print(ddr_bw['utilized_bw'])
            print(ddr_bw['utilized_pct'])
except AmdSmiException as e:
    print(e)
```

9.2.23 amdsmi_get_cpu_socket_temperature

Description: Get the socket temperature.

Output: amdsmi temperature value

Exceptions that can be thrown by amdsmi_get_cpu_socket_temperature function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            ptmon = amdsmi_get_cpu_socket_temperature(processor)
            print(ptmon)
except AmdSmiException as e:
    print(e)
```

9.2.24 amdsmi_get_cpu_dimm_temp_range_and_refresh_rate

Description: Get DIMM temperature range and refresh rate.

Output: amdsmi dimm metric data

Exceptions that can be thrown by `amdsmi_get_cpu_dimm_temp_range_and_refresh_rate` function:

- `AmdSmiLibraryException`

Example:

```
try:
    processor_handles = amdsmi_get_cpsocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            dimm = amdsmi_get_cpu_dimm_temp_range_and_refresh_rate(processor)
            print(dimm['range'])
            print(dimm['ref_rate'])
except AmdSmiException as e:
    print(e)
```

9.2.25 amdsmi_get_cpu_dimm_power_consumption

Description: `amdsmi_get_cpu_dimm_power_consumption`.

Output: amdsmi dimm power consumption value

Exceptions that can be thrown by `amdsmi_get_cpu_dimm_power_consumption` function:

- `AmdSmiLibraryException`

Example:

```
try:
    processor_handles = amdsmi_get_cpsocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            dimm = amdsmi_get_cpu_dimm_power_consumption(processor)
            print(dimm['power'])
            print(dimm['update_rate'])
            print(dimm['dimm_addr'])
except AmdSmiException as e:
    print(e)
```

9.2.26 amdsmi_get_cpu_dimm_thermal_sensor

Description: Get DIMM thermal sensor value.

Output: amdsmi dimm temperature data

Exceptions that can be thrown by `amdsmi_get_cpu_dimm_thermal_sensor` function:

- `AmdSmiLibraryException`

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            dimm = amdsmi_get_cpu_dimm_thermal_sensor(processor)
            print(dimm['sensor'])
            print(dimm['update_rate'])
            print(dimm['dimm_addr'])
            print(dimm['temp'])
except AmdSmiException as e:
    print(e)

```

9.2.27 amdsmi_set_cpu_xgmi_width

Description: Set xgmi width.

Input: amdsmi xgmi width

Exceptions that can be thrown by amdsmi_set_cpu_xgmi_width function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            xgmi_width = amdsmi_set_cpu_xgmi_width(processor, 0, 100)
except AmdSmiException as e:
    print(e)

```

9.2.28 amdsmi_set_cpu_gmi3_link_width_range

Description: Set gmi3 link width range.

Input: minimum & maximum link width to be set.

Exceptions that can be thrown by amdsmi_set_cpu_gmi3_link_width_range function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            gmi_link_width = amdsmi_set_cpu_gmi3_link_width_range(processor, 0, 100)
except AmdSmiException as e:
    print(e)

```

9.2.29 amdsmi_cpu_apb_enable

Description: Enable APB.

Input: amdsmi processor handle

Exceptions that can be thrown by amdsmi_cpu_apb_enable function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            apb_enable = amdsmi_cpu_apb_enable(processor)
except AmdSmiException as e:
    print(e)
```

9.2.30 amdsmi_cpu_apb_disable

Description: Disable APB.

Input: pstate value

Exceptions that can be thrown by amdsmi_cpu_apb_disable function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            apb_disable = amdsmi_cpu_apb_disable(processor, 0)
except AmdSmiException as e:
    print(e)
```

9.2.31 amdsmi_set_cpu_socket_lclk_dpm_level

Description: Set NBIO lclk dpm level value.

Input: nbio id, min value, max value

Exceptions that can be thrown by amdsmi_set_cpu_socket_lclk_dpm_level function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
```

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```
    print("No CPU sockets on machine")
else:
    for socket in socket_handles:
        nbio = amdsmi_set_cpu_socket_lclk_dpm_level(socket, 0, 0, 2)
except AmdSmiException as e:
    print(e)
```

9.2.32 amdsmi_get_cpu_socket_lclk_dpm_level

Description: Get NBIO LCLK dpm level.

Output: nbio id

Exceptions that can be thrown by amdsmi_get_cpu_socket_lclk_dpm_level function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            nbio = amdsmi_get_cpu_socket_lclk_dpm_level(processor)
            print(nbio['max_dpm_level'])
            print(nbio['max_dpm_level'])
except AmdSmiException as e:
    print(e)
```

9.2.33 amdsmi_set_cpu_pcie_link_rate

Description: Set pcie link rate.

Input: rate control value

Exceptions that can be thrown by amdsmi_set_cpu_pcie_link_rate function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            link_rate = amdsmi_set_cpu_pcie_link_rate(processor, 0, 0)
except AmdSmiException as e:
    print(e)
```

9.2.34 amdsmi_set_cpu_df_pstate_range

Description: Set df pstate range.

Input: max pstate, min pstate

Exceptions that can be thrown by amdsmi_set_cpu_df_pstate_range function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            pstate_range = amdsmi_set_cpu_df_pstate_range(processor, 0, 2)
except AmdSmiException as e:
    print(e)
```

9.2.35 amdsmi_get_cpu_current_io_bandwidth

Description: Get current input output bandwidth.

Output: link id and bw type to which io bandwidth to be obtained

Exceptions that can be thrown by amdsmi_get_cpu_current_io_bandwidth function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            io_bw = amdsmi_get_cpu_current_io_bandwidth(processor)
            print(io_bw)
except AmdSmiException as e:
    print(e)
```

9.2.36 amdsmi_get_cpu_current_xgmi_bw

Description: Get current xgmi bandwidth.

Output: amdsmi link id and bw type to which xgmi bandwidth to be obtained

Exceptions that can be thrown by amdsmi_get_cpu_current_xgmi_bw function:

- AmdSmiLibraryException

Example:

```
try:
    processor_handles = amdsmi_get_cpusocket_handles()
```

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```

if len(processor_handles) == 0:
    print("No CPU sockets on machine")
else:
    for processor in processor_handles:
        xgmi_bw = amdsmi_get_cpu_current_xgmi_bw(processor)
        print(xgmi_bw)
except AmdSmiException as e:
    print(e)

```

9.2.37 amdsmi_get_hsmp_metrics_table_version

Description: Get HSMP metrics table version.

Output: amdsmi HSMP metrics table version

Exceptions that can be thrown by amdsmi_get_hsmp_metrics_table_version function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            met_ver = amdsmi_get_hsmp_metrics_table_version(processor)
            print(met_ver)
except AmdSmiException as e:
    print(e)

```

9.2.38 amdsmi_get_hsmp_metrics_table

Description: Get HSMP metrics table

Output: HSMP metric table data

Exceptions that can be thrown by amdsmi_get_hsmp_metrics_table function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            mtbl = amdsmi_get_hsmp_metrics_table(processor)
            print(mtbl['accumulation_counter'])
            print(mtbl['max_socket_temperature'])
            print(mtbl['max_vr_temperature'])
            print(mtbl['max_hbm_temperature'])
            print(mtbl['socket_power_limit'])

```

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```

        print(mtbl['max_socket_power_limit'])
        print(mtbl['socket_power'])
except AmdSmiException as e:
    print(e)

```

9.2.39 amdsmi_first_online_core_on_cpu_socket

Description: Get first online core on cpu socket.

Output: first online core on cpu socket

Exceptions that can be thrown by amdsmi_first_online_core_on_cpu_socket function:

- AmdSmiLibraryException

Example:

```

try:
    processor_handles = amdsmi_get_cpusocket_handles()
    if len(processor_handles) == 0:
        print("No CPU sockets on machine")
    else:
        for processor in processor_handles:
            pcore_ind = amdsmi_first_online_core_on_cpu_socket(processor)
            print(pcore_ind)
except AmdSmiException as e:
    print(e)

```

9.2.40 amdsmi_get_cpu_family

Description: Get cpu family.

Output: cpu family

Exceptions that can be thrown by amdsmi_get_cpu_family function:

- AmdSmiLibraryException

Example:

```

try:
    cpu_family = amdsmi_get_cpu_family()
    print(cpu_family)
except AmdSmiException as e:
    print(e)

```

9.2.41 amdsmi_get_cpu_model

Description: Get cpu model.

Output: cpu model

Exceptions that can be thrown by amdsmi_get_cpu_model function:

- AmdSmiLibraryException

Example:

```
try:
    cpu_model = amdsmi_get_cpu_model()
    print(cpu_model)
except AmdSmiException as e:
    print(e)
```

9.2.42 amdsmi_get_cpu_model_name

Description: Get cpu model name.

Output: cpu model name

Exceptions that can be thrown by amdsmi_get_cpu_model_name function:

- AmdSmiLibraryException

Example:

```
try:
    cpu_model_name = amdsmi_get_cpu_model_name()
    print(cpu_model_name)
except AmdSmiException as e:
    print(e)
```

9.3 No amdsmi_init APIs

9.3.1 amdsmi_get_lib_version

Description: Get the build version information for the currently running build of AMDSMI. This function doesn't require amdsmi library init.

Output: amdsmi build version

Exceptions that can be thrown by amdsmi_get_lib_version function:

- AmdSmiLibraryException
- AmdSmiRetryException
- AmdSmiParameterException

Example:

```
try:
    version = amdsmi_get_lib_version()
    print(version)
except AmdSmiException as e:
    print(e)
```

9.3.2 amdsmi_get_rocm_version

Description: This function attempts to retrieve the ROCm version by loading the librocm-core.so shared library. This function doesn't require amdsmi library init.

Output: Tuple (bool, str) containing rocm_load_status and version_message

Exceptions that can be thrown by amdsmi_get_rocm_version function:

- AmdSmiLibraryException

Example:

```
try:
    import amdsmi
    rocm_load_status, version_message = amdsmi_get_rocm_version()
    print(f"ROCM load status: {rocm_load_status}")
    print(f"ROCM version msg: {version_message}")
except AmdSmiException as e:
    print(e)
```


AMD SMI GO API REFERENCE

The AMD SMI Go interface provides a convenient way to interact with AMD hardware through a simple and accessible API. The API is compatible with Go version 1.20 and higher and requires the AMD driver to be loaded for initialization. Review the *prerequisites* before getting started.

This section provides documentation for the AMD SMI Go API. Explore these sections to understand the full scope of available functionalities and how to implement them in your applications.

10.1 GPU functions

10.1.1 GO_gpu_init

```
func GO_gpu_init() bool
```

GO_gpu_init initializes the GPU and reports whether the initialization was successful. This function must be called before using other AMD SMI functions.

Output: bool, returns true on success or false on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    GPU initialization is successful...
}
```

10.1.2 GO_gpu_shutdown

```
func GO_gpu_shutdown() bool
```

GO_gpu_shutdown shuts down the GPU and reports whether the shutdown was successful.

Output: bool, returns true on success or false on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_shutdown() {
    GPU shutdown is successful...
}
```

10.1.3 GO_gpu_num_monitor_devices

```
func GO_gpu_num_monitor_devices() uint
```

GO_gpu_num_monitor_devices returns the number of GPU monitor devices available.

Output: uint, returns the number of GPU monitor devices on success or 0 on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_shutdown() {
    GPU shutdown is successful...
}
```

10.1.4 GO_gpu_dev_name_get

```
func GO_gpu_dev_name_get(i int) *C.char
```

GO_gpu_dev_name_get returns the name of the GPU device at the specified GPU index.

Input parameter: int, GPU index.

Output: char*, returns GPU device name on success or "NA" on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        goamdsmi.GO_gpu_dev_name_get(i)
    }
}
```

10.1.5 GO_gpu_dev_id_get

```
func GO_gpu_dev_id_get(i int) C.uint16_t
```

GO_gpu_dev_id_get returns the device ID of the GPU device at the specified GPU index.

Input parameter: int, GPU index.

Output: uint16, returns GPU device ID on success or 0xFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        value16 := goamdsmi.GO_gpu_dev_id_get(i)
    }
}
```

10.1.6 GO_gpu_dev_pci_id_get

```
func GO_gpu_dev_pci_id_get(i int) C.uint64_t
```

GO_gpu_dev_pci_id_get returns the device PCI ID of the device at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU devices PCI ID on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    dev_pci_id := int(goamdsmi.GO_gpu_dev_pci_id_get())
}
```

10.1.7 GO_gpu_dev_vbios_version_get

```
func GO_gpu_dev_vbios_version_get(i int) *C.char
```

GO_gpu_dev_vbios_version_get returns the VBIOS version of the GPU device at the specified GPU index.

Input parameter: int, GPU index.

Output: char*, returns VBIOS version on success or "NA" on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    dev_pci_id := int(goamdsmi.GO_gpu_dev_pci_id_get())
}
```

10.1.8 GO_gpu_dev_vendor_name_get

```
func GO_gpu_dev_vendor_name_get(i int) *C.char
```

GO_gpu_dev_vendor_name_get returns the vendor name of the GPU device at the specified GPU index.

Input parameter: int, GPU index.

Output: char*, returns the GPU device name on success or "NA" on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        goamdsmi.GO_gpu_dev_vendor_name_get()
    }
}
```

10.1.9 GO_gpu_dev_power_cap_get

```
func GO_gpu_dev_power_cap_get(i int) C.uint64_t
```

GO_gpu_dev_power_cap_get returns the power cap of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU power cap on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_power_cap := int(goamdsmi.GO_gpu_dev_power_cap_get(i))
    }
}
```

10.1.10 GO_gpu_dev_power_get

```
func GO_gpu_dev_power_get(i int) C.uint64_t
```

GO_gpu_dev_power_get returns the power of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU power on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_power := int(goamdsmi.GO_gpu_dev_power_get(i))
    }
}
```

10.1.11 GO_gpu_dev_temp_metric_get

```
func GO_gpu_dev_temp_metric_get(i int, sensor int, metric int) C.uint64_t
```

GO_gpu_dev_temp_metric_get returns the temperature of the GPU at the specified GPU index, sensor, and metric number.

Input parameters:

- int, GPU index.
- int, sensor number.
- int, metric number.

Output: uint64, returns GPU temperature on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        temp := int(goamdsmi.GO_gpu_dev_temp_metric_get(i, 1, 0))
    }
}
```

10.1.12 GO_gpu_dev_perf_level_get

```
func GO_gpu_dev_perf_level_get(i int) C.uint32_t
```

GO_gpu_dev_perf_level_get returns the perf level of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint32, returns GPU perf level on success or 0xFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_perf_level := int(goamdsmi.GO_gpu_dev_perf_level_get(i))
    }
}
```

10.1.13 GO_gpu_dev_overdrive_level_get

```
func GO_gpu_dev_overdrive_level_get(i int) C.uint32_t
```

GO_gpu_dev_overdrive_level_get returns the overdrive level of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint32, returns GPU perf level on success or 0xFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_overdrive_level := int(goamdsmi.GO_gpu_dev_overdrive_level_get(i))
    }
}
```

10.1.14 GO_gpu_dev_mem_overdrive_level_get

```
func GO_gpu_dev_mem_overdrive_level_get(i int) C.uint32_t
```

GO_gpu_dev_mem_overdrive_level_get returns the mem overdrive level of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint32, returns GPU perf level on success or 0xFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        mem_overdrive_level := int(goamdsmi.GO_gpu_dev_mem_overdrive_level_get(i))
    }
}
```

10.1.15 GO_gpu_dev_gpu_clk_freq_get_sclk

```
func GO_gpu_dev_gpu_clk_freq_get_sclk(i int) C.uint64_t
```

GO_gpu_dev_gpu_clk_freq_get_sclk returns the system clock (SCLK) frequency of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU SCLK frequency level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_sclk_freq := int(goamdsmi.GO_gpu_dev_gpu_clk_freq_get_sclk(i))
    }
}
```

10.1.16 GO_gpu_dev_gpu_clk_freq_get_mclk

```
func GO_gpu_dev_gpu_clk_freq_get_mclk(i int) C.uint64_t
```

GO_gpu_dev_gpu_clk_freq_get_mclk returns the memory clock (MCLK) frequency of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU MCLK frequency level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_sclk_freq := int(goamdsmi.GO_gpu_dev_gpu_clk_freq_get_mclk(i))
    }
}
```

10.1.17 GO_gpu_od_volt_freq_range_min_get_sclk

```
func GO_gpu_od_volt_freq_range_min_get_sclk(i int) C.uint64_t
```

GO_gpu_od_volt_freq_range_min_get_sclk returns the minimum system clock (SCLK) frequency of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU minimum SCLK frequency level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_min_sclk := int(goamdsmi.GO_gpu_od_volt_freq_range_min_get_sclk(i))
    }
}
```

10.1.18 GO_gpu_od_volt_freq_range_min_get_mclk

```
func GO_gpu_od_volt_freq_range_min_get_mclk(i int) C.uint64_t
```

GO_gpu_od_volt_freq_range_min_get_mclk returns the minimum memory clock (MCLK) frequency of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU minimum MCLK frequency level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_min_mclk := int(goamdsmi.GO_gpu_od_volt_freq_range_min_get_mclk(i))
    }
}
```

10.1.19 GO_gpu_od_volt_freq_range_max_get_sclk

```
func GO_gpu_od_volt_freq_range_max_get_sclk(i int) C.uint64_t
```

GO_gpu_od_volt_freq_range_max_get_sclk returns the maximum system clock (SCLK) frequency of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU maximum SCLK frequency level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_max_sclk := int(goamdsmi.GO_gpu_od_volt_freq_range_max_get_sclk(i))
    }
}
```

10.1.20 GO_gpu_od_volt_freq_range_max_get_mclk

```
func GO_gpu_od_volt_freq_range_max_get_mclk(i int) C.uint64_t
```

GO_gpu_od_volt_freq_range_max_get_mclk returns the maximum memory clock (MCLK) frequency of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU maximum MCLK frequency level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_max_mclk := int(goamdsmi.GO_gpu_od_volt_freq_range_max_get_mclk(i))
    }
}
```

10.1.21 GO_gpu_dev_gpu_busy_percent_get

```
func GO_gpu_dev_gpu_busy_percent_get(i int) C.uint32_t
```

GO_gpu_dev_gpu_busy_percent_get returns the busy percentage of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint32, returns GPU busy percentage on success or 0xFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        dev_busy_perc := int(goamdsmi.GO_gpu_dev_gpu_busy_percent_get(i))
    }
}
```

10.1.22 GO_gpu_dev_gpu_memory_busy_percent_get

```
func GO_gpu_dev_gpu_memory_busy_percent_get(i int) C.uint64_t
```

GO_gpu_dev_gpu_memory_busy_percent_get returns the memory busy percentage of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU memory busy percentage on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        mem_busy_perc := int(goamdsmi.GO_gpu_dev_gpu_memory_busy_percent_get(i))
    }
}
```

10.1.23 GO_gpu_dev_gpu_memory_usage_get

```
func GO_gpu_dev_gpu_memory_usage_get(i int) C.uint64_t
```

GO_gpu_dev_gpu_memory_usage_get returns the memory usage of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU memory usage on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        mem_usage := int(goamdsmi.GO_gpu_dev_gpu_memory_usage_get(i))
    }
}
```

10.1.24 GO_gpu_dev_gpu_memory_total_get

```
func GO_gpu_dev_gpu_memory_total_get(i int) C.uint64_t
```

GO_gpu_dev_gpu_memory_total_get returns the total memory of the GPU at the specified GPU index.

Input parameter: int, GPU index.

Output: uint64, returns GPU memory usage on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_gpu_init() {
    num_gpus := int(goamdsmi.GO_gpu_num_monitor_devices())
    for i := 0; i < num_gpus; i++ {
        mem_total := int(goamdsmi.GO_gpu_dev_gpu_memory_total_get(i))
    }
}
```

10.2 CPU functions

10.2.1 GO_cpu_init

```
func GO_cpu_init() bool
```

GO_cpu_init initializes the CPU and reports whether the initialization was successful.

Output: bool, returns true on success or false on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    CPU initialization is successful...
}
```

10.2.2 GO_cpu_number_of_sockets_get

```
func GO_cpu_number_of_sockets_get() uint
```

GO_cpu_number_of_sockets_get returns the number of available CPU sockets.

Output: uint, returns the number of CPU sockets on success or 0 on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_sockets := int(goamdsmi.GO_cpu_number_of_sockets_get())
}
```

10.2.3 GO_cpu_number_of_threads_get

```
func GO_cpu_number_of_threads_get() uint
```

GO_cpu_number_of_threads_get returns the number of available CPU sockets.

Output: uint, returns the number of CPU threads on success or 0 on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_threads := int(goamdsmi.GO_cpu_number_of_threads_get())
}
```

10.2.4 GO_cpu_threads_per_core_get

```
func GO_cpu_threads_per_core_get() uint
```

GO_cpu_threads_per_core_get returns the thread count per available CPU core.

Output: uint, returns the CPU thread count on success or 0 on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_threads_per_core := int(goamdsmi.GO_cpu_threads_per_core_get())
}
```

10.2.5 GO_cpu_core_energy_get

```
func GO_cpu_core_energy_get(i int) C.uint64_t
```

GO_cpu_core_energy_get returns the CPU core energy for the specified thread index.

Input parameter: int, thread index.

Output: uint64, returns CPU core energy on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCm/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_threads := int(goamdsmi.GO_cpu_number_of_threads_get())
    for i := 0; i < num_threads; i++ {
        core_energy := int(goamdsmi.GO_cpu_core_energy_get(i))
    }
}
```

10.2.6 GO_cpu_core_boostlimit_get

```
func GO_cpu_core_boostlimit_get(i int) C.uint32_t
```

GO_cpu_core_boostlimit_get returns the CPU core boost limit for the specified thread index.

Input parameter: int, thread index.

Output: uint32, returns CPU core boost limit on success or 0xFFFFFFFF on fail.

Example:

```
import "github.com/ROCM/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_threads := int(goamdsmi.GO_cpu_number_of_threads_get())
    for i := 0; i < num_threads; i++ {
        core_boost_limit := int(goamdsmi.GO_cpu_core_boostlimit_get(i))
    }
}
```

10.2.7 GO_cpu_socket_energy_get

```
func GO_cpu_socket_energy_get(i int) C.uint64_t
```

GO_cpu_socket_energy_get returns the CPU socket energy for the specified socket index.

Input parameter: int, socket index.

Output: uint64, returns socket energy level on success or 0xFFFFFFFFFFFFFFFF on fail.

Example:

```
import "github.com/ROCM/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_sockets := int(goamdsmi.GO_cpu_number_of_sockets_get())
    for i := 0; i < num_sockets; i++ {
        socket_energy := int(goamdsmi.GO_cpu_socket_energy_get(i))
    }
}
```

10.2.8 GO_cpu_socket_power_get

```
func GO_cpu_socket_power_get(i int) C.uint32_t
```

GO_cpu_socket_power_get returns the socket power for the specified socket index.

Input parameter: int, socket index.

Output: uint32, returns socket energy level on success or 0xFFFFFFFF on fail.

Example:

```
import "github.com/ROCM/amdsmi"

if true == goamdsmi.GO_cpu_init() {
```

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```

num_sockets := int(goamdsmi.GO_cpu_number_of_sockets_get())
for i := 0; i < num_sockets; i++ {
    socket_power := int(goamdsmi.GO_cpu_socket_power_get(i))
}
}

```

10.2.9 GO_cpu_socket_power_cap_get

```
func GO_cpu_socket_power_cap_get(i int) C.uint32_t
```

GO_cpu_socket_power_cap_get returns the socket power cap for the specified socket index.

Input parameter: int, socket index.

Output: uint32, returns socket power cap on success or 0xFFFFFFFF on fail.

Example:

```

import "github.com/ROCM/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_sockets := int(goamdsmi.GO_cpu_number_of_sockets_get())
    for i := 0; i < num_sockets; i++ {
        socket_power_cap := int(goamdsmi.GO_cpu_socket_power_cap_get(i))
    }
}

```

10.2.10 GO_cpu_prochot_status_get

```
func GO_cpu_prochot_status_get(i int) C.uint32_t
```

GO_cpu_prochot_status_get returns the PROCHOT status for the specified socket index.

Input parameter: int, socket index.

Output: uint32, returns PROCHOT status on success or 0xFFFFFFFF on fail.

Example:

```

import "github.com/ROCM/amdsmi"

if true == goamdsmi.GO_cpu_init() {
    num_sockets := int(goamdsmi.GO_cpu_number_of_sockets_get())
    for i := 0; i < num_sockets; i++ {
        prochot_status := int(goamdsmi.GO_cpu_prochot_status_get(i))
    }
}

```


CHANGELOG FOR AMD SMI LIBRARY

Full documentation for `amd_smi_lib` is available at <https://rocm.docs.amd.com/projects/amdsmi>.

All information listed below is for reference and subject to change.

11.1 `amd_smi_lib` for ROCm 7.0.2

11.1.1 Added

- **Add `bad_page_threshold_exceeded` to `amd-smi static --ras`.**
 - Added `bad_page_threshold_exceeded` field to `amd-smi static --ras`, which compares retired pages count against bad page threshold. This field displays True if retired pages exceed the threshold, False if within threshold, or N/A if threshold data is unavailable. Users should note that sudo is required to have the `bad_page_threshold_exceeded` field populated.

```
$ sudo amd-smi static --ras -g 0
GPU: 0
RAS:
  EEPROM_VERSION: 0x30000
  BAD_PAGE_THRESHOLD: 128
  BAD_PAGE_THRESHOLD_EXCEEDED: False
  PARITY_SCHEMA: DISABLED
  SINGLE_BIT_SCHEMA: DISABLED
  DOUBLE_BIT_SCHEMA: DISABLED
  POISON_SCHEMA: ENABLED
...
```

11.1.2 Changed

- N/A

11.1.3 Removed

- **Removed `gpuboard` and `baseboard` temperatures enums in `amdsmi` Python Library.**
 - `AmdSmiTemperatureType` had issues with referencing the right attribute, so we removed the following duplicate enums:
 - * `AmdSmiTemperatureType.GPUBOARD_NODE_FIRST`
 - * `AmdSmiTemperatureType.GPUBOARD_VR_FIRST`
 - * `AmdSmiTemperatureType.BASEBOARD_FIRST`

11.1.4 Optimized

- **Implemented reference counting to manage init and shutdown processes.**
 - This allows multiple initializations and shutdowns of amdsmi.

11.1.5 Resolved issues

- **Fixed attribute error in amd-smi monitor on Linux Guest systems where violations argument caused CLI to break.**
- **Fixed certain output in amd-smi monitor when GPUs are partitioned.**
 - Fixes amd-smi monitor such as: `amd-smi monitor -Vqt`, `amd-smi monitor -g 0 -Vqt -w 1`, `amd-smi monitor -Vqt --file /tmp/test1`, etc. Those such commands will now be able to display as normal in partitioned GPU scenarios.
- **Fixed an issue where using amd-smi ras --folder <folder_name> was forcing the created folder's name to be lowercase.**
 - This fix also allows all string input options to be case insensitive.
- **Added KFD Fallback for process detection.**
 - Some processes were not being detected by AMD SMI despite making use of KFD resources. This fix ensures that all KFD processes will be detected.
- **Multiple CPER issues were fixed.**
 - Fixed issue where we were unable to query for additional CPERs after 20 were generated on a single device.
 - Fixed issue where RAS HBM CRC read was failing due to incorrect AFID value.
 - Fixed issue where RAS injections were not always producing related CPERs.

11.1.6 Upcoming changes

- N/A

11.1.7 Known issues

- N/A

11.2 amd_smi_lib for ROCm 7.0.0

11.2.1 Added

- **Added restarting (reloading) AMD GPU driver to both CLI and API calls**
 - Refer to *Separated driver reload from amdsmi_set_gpu_memory_partition() / amdsmi_set_gpu_memory_partition_mode() and CLI (sudo amd-smi set -M <NPS mode>)* section for more details.
- **Added the Default command.**
 - A default view has been added. The default view provides a snapshot of commonly requested information such as bdf, current partition mode, version information, and more. Users can access that information by simply typing `amd-smi` with no additional commands or arguments. Users may also obtain this information through alternate output formats such as json or csv by using the default command with the respective output format: `amd-smi default --json` or `amd-smi default --csv`.

```

$ amd-smi
+-----+
| AMD-SMI 26.0.0+ea54ecc      amdgpu version: 6.12.12  ROCm version: 7.0.0 |
| Platform: Linux Baremetal |
+-----+
| BDF          GPU-Name | Mem-Util  Temp  UEC      Power-Usage |
| GPU  HIP-ID  OAM-ID  Partition-Mode | GFX-Util  Fan   | Mem-Usage |
+-----+
| 0000:0c:00.0  AMD Instinct MI300X | 13 %     60 °C  0        734/750 W |
| 0          0      2      SPX/NPS1 | 98 %     N/A   | 4976/196592 MB |
+-----+
| 0000:22:00.0  AMD Instinct MI300X | 10 %     60 °C  0        652/750 W |
| 1          1      1      SPX/NPS1 | 83 %     N/A   | 4976/196592 MB |
+-----+
| 0000:38:00.0  AMD Instinct MI300X | 5 %      55 °C  0        376/750 W |
| 2          2      0      SPX/NPS1 | 34 %     N/A   | 4976/196592 MB |
+-----+
| 0000:5c:00.0  AMD Instinct MI300X | 2 %      57 °C  0        234/750 W |
| 3          3      3      SPX/NPS1 | 12 %     N/A   | 4976/196592 MB |
+-----+
| 0000:9f:00.0  AMD Instinct MI300X | 1 %      57 °C  0        219/750 W |
| 4          4      7      SPX/NPS1 | 11 %     N/A   | 4976/196592 MB |
+-----+
| 0000:af:00.0  AMD Instinct MI300X | 3 %      61 °C  0        295/750 W |
| 5          5      5      SPX/NPS1 | 23 %     N/A   | 4976/196592 MB |
+-----+
| 0000:bf:00.0  AMD Instinct MI300X | 5 %      58 °C  0        367/750 W |
| 6          6      4      SPX/NPS1 | 36 %     N/A   | 4976/196592 MB |
+-----+
| 0000:df:00.0  AMD Instinct MI300X | 6 %      62 °C  0        434/750 W |
| 7          7      6      SPX/NPS1 | 47 %     N/A   | 4976/196592 MB |
+-----+
+-----+
| Processes: |
| GPU      PID  Process Name      GTT_MEM  VRAM_MEM  MEM_USAGE  CU % |
+-----+
| 0      2427396  rvs                2.0 MB   2.0 GB    2.5 GB     0.0 % |
| 1      2427396  rvs                2.0 MB   2.2 GB    2.6 GB     0.0 % |
| 2      2427396  rvs                2.0 MB   2.3 GB    2.7 GB     0.0 % |
| 3      2427396  rvs                2.0 MB   2.3 GB    2.7 GB     0.0 % |
| 4      2427396  rvs                2.0 MB   2.1 GB    2.5 GB     0.0 % |
| 5      2427396  rvs                2.0 MB   2.0 GB    2.2 GB     0.0 % |
| 6      2427396  rvs                2.0 MB   2.1 GB    2.4 GB     0.0 % |
| 7      2427396  rvs                2.0 MB   2.1 GB    2.5 GB     0.0 % |
+-----+

```

- **Added support for GPU metrics 1.8.**

- Added new fields for `amdsmi_gpu_xcp_metrics_t` including:

- * Adding the following metrics to allow new calculations for violation status:

- * Per XCP metrics `gfx_below_host_limit_ppt_acc[XCP][MAX_XCC]` - GFX Clock Host limit Package Power Tracking violation counts

- * Per XCP metrics `gfx_below_host_limit_thm_acc[XCP][MAX_XCC]` - GFX Clock Host limit Thermal (TVIOL) violation counts
- * Per XCP metrics `gfx_low_utilization_acc[XCP][MAX_XCC]` - violation counts for how did low utilization caused the GPU to be below application clocks.
- * Per XCP metrics `gfx_below_host_limit_total_acc[XCP][MAX_XCC]`- violation counts for how long GPU was held below application clocks any limiter (see above new violation metrics).
- Increasing available JPEG engines to 40.
Current ASICs may not support all 40. These will be indicated as `UINT16_MAX` or `N/A` in CLI.
- **Added bad page threshold count.**
 - Added `amdsmi_get_gpu_bad_page_threshold` to Python API and CLI; root/sudo permissions required to display the count.
- **Updated `amdsmi_get_gpu_asic_info` in `amdsmi.h`.**
 - Added `subsystem_id` structure member.
- **Added cpu model name for RDC.**
 - Added new C and Python API `amdsmi_get_cpu_model_name`
 - Not sourced from `esmi` library.
- **Added `amdsmi_get_cpu_affinity_with_scope()`.**
- **Added socket power to `amdsmi_get_power_info`**
 - Previously the C API had the value in the `amdsmi_power_info` structure, but was unused
 - Now we populate the value in both C & Python APIs
 - The value is representative of the socket's power agnostic of the the GPU version.

11.2.2 Changed

- **Separated `driver reload` from `amdsmi_set_gpu_memory_partition()` / `amdsmi_set_gpu_memory_partition_mode()` and CLI (`sudo amd-smi set -M <NPS mode>`)**
 - Providing new API (`amdsmi_gpu_driver_reload()`) and CLI (`sudo amd-smi reset -r` or `sudo amd-smi reset --reload-driver`) once user is ready to reload driver. We understand the automatic reload could be at an inconvenient time. This is why we now provide this functionality in separate API/CLI commands to use when the time is right.
 - It is important to understand, the memory (NPS) partition change requires:
 - 1) Memory partition change request (`amdsmi_set_gpu_memory_partition()` / `amdsmi_set_gpu_memory_partition_mode()`) or CLI (`sudo amd-smi set -M <NPS mode>`)
 - 2) Driver reload (`amdsmi_gpu_driver_reload()` / `sudo amd-smi reset -r` or `sudo amd-smi reset --reload-driver`) [*] *Driver reload requires all GPU activity on all devices to be stopped.*
- **Modified `amd-smi CLI monitor and metric` for violations.**
 - Disabled `amd-smi monitor --violation` on guests.
 - Modified `amd-smi metric -T/--throttle` to alias to `amd-smi metric -v/--violation`.
- **Updated `amdsmi_get_clock_info` in `amdsmi_interface.py`.**
 - The `clk_deep_sleep` field now returns the sleep integer value.

- **The `amd-smi topology` command has been enabled for Guest environments.**
 - `amd-smi topology` is now available in Guest environments. This includes full functionality so users can use the command just as they would in Bare Metal environments.
- **Expanded Violation Status tracking for GPU metrics 1.8.**
 - The driver will no longer be supporting existing single-value GFX Clk Below Host Limit fields (`acc_gfx_clk_below_host_limit`, `per_gfx_clk_below_host_limit`, `active_gfx_clk_below_host_limit`), they are now changed in favor of new per-XCP/XCC arrays.
 - Added new fields to `amdsmi_violation_status_t` and related interfaces for enhanced violation breakdown:
 - * Per-XCP/XCC accumulators and status for:
 - GFX Clock Below Host Limit (Power, Thermal, and Total)
 - Low Utilization
 - * Added 2D arrays to track per-XCP/XCC accumulators, percentage, and active status:
 - `acc_gfx_clk_below_host_limit_pwr`, `acc_gfx_clk_below_host_limit_thm`,
`acc_gfx_clk_below_host_limit_total`
 - `per_gfx_clk_below_host_limit_pwr`, `per_gfx_clk_below_host_limit_thm`,
`per_gfx_clk_below_host_limit_total`
 - `active_gfx_clk_below_host_limit_pwr`, `active_gfx_clk_below_host_limit_thm`,
`active_gfx_clk_below_host_limit_total`
 - `acc_low_utilization`, `per_low_utilization`, `active_low_utilization`
 - Python API and CLI now report these expanded fields.
 - Example outputs:

```

$ amd-smi monitor -V
GPU XCP PVIOL TVIOL TVIOL_ACTIVE PHOT_TVIOL VR_TVIOL HBM_TVIOL GFX_
└─CLKVIOL                                GFXCLK_PVIOL                                ┘
└─
└─                                GFXCLK_TVIOL                                ┘
└─                                GFXCLK_TOTALVIOL                                LOW_
└─UTILVIOL
  0  0  0 %  0 %                False                0 %    0 %    0 %
└─N/A                [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
└─ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
└─ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
└─ %]
  1  0  0 %  0 %                False                0 %    0 %    0 %
└─N/A                [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
└─ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
└─ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
└─ %]
  2  0  0 %  0 %                False                0 %    0 %    0 %
└─N/A                [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
└─ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
└─ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
└─ %]
  3  0  0 %  0 %                False                0 %    0 %    0 %
└─

```

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```

→N/A [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
→ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
→ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
→%]
4 0 0 % 0 % False 0 % 0 % 0 %
→N/A [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
→ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
→ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
→%]
5 0 0 % 0 % False 0 % 0 % 0 %
→N/A [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
→ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
→ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
→%]
6 0 0 % 0 % False 0 % 0 % 0 %
→N/A [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
→ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
→ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
→%]
7 0 0 % 0 % False 0 % 0 % 0 %
→N/A [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
→ [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %] [100 %, 100 %, 100 %, 100 %, 100 %,
→ 100 %, 100 %, 100 %] [100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100 %, 100
→%]

```

```
$ sudo amd-smi set -C DPX > /dev/null
```

```
$ amd-smi monitor -V
```

```

GPU XCP PVIOL TVIOL TVIOL_ACTIVE PHOT_TVIOL VR_TVIOL HBM_TVIOL GFX_
→CLKVIOL GFXCLK_PVIOL
→ GFXCLK_TVIOL
→ GFXCLK_TOTALVIOL LOW_
→UTILVIOL
0 0 0 % 0 % False 0 % 0 % 0 %
→N/A [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
→ [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A] [100 %, 100 %, 100 %, 100
→%, N/A, N/A, N/A, N/A] [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/
→A]
0 1 N/A N/A N/A N/A N/A N/A
→N/A [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
→ [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A] [100 %, 100 %, 100 %, 100
→%, N/A, N/A, N/A, N/A] [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/
→A]
1 1 N/A N/A N/A N/A N/A N/A
→N/A N/A
→ N/A
→ N/A
→A
2 0 0 % 0 % False 0 % 0 % 0 %
→N/A [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
→ [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A] [100 %, 100 %, 100 %, 100
→%, N/A, N/A, N/A, N/A] [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/

```

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```

↪A]
  2   1   N/A   N/A           N/A           N/A           N/A           N/A           ↪
↪N/A           [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
↪ [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]           [100 %, 100 %, 100 %, 100
↪%, N/A, N/A, N/A, N/A]           [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/
↪A]
...

```

```

$ amd-smi metric -v -g 0
GPU: 0
  THROTTLE:
    ACCUMULATION_COUNTER: 8213780
    PROCHOT_ACCUMULATED: 0
    PPT_ACCUMULATED: 2
    SOCKET_THERMAL_ACCUMULATED: 0
    VR_THERMAL_ACCUMULATED: 0
    HBM_THERMAL_ACCUMULATED: 0
    GFX_CLK_BELOW_HOST_LIMIT_ACCUMULATED: N/A
    GFX_CLK_BELOW_HOST_LIMIT_POWER_ACCUMULATED:
      XCP_0: [0, 0, 0, 0, N/A, N/A, N/A, N/A]
      XCP_1: [0, 0, 0, 0, N/A, N/A, N/A, N/A]
    GFX_CLK_BELOW_HOST_LIMIT_THERMAL_ACCUMULATED:
      XCP_0: [0, 0, 0, 0, N/A, N/A, N/A, N/A]
      XCP_1: [0, 0, 0, 0, N/A, N/A, N/A, N/A]
    TOTAL_GFX_CLK_BELOW_HOST_LIMIT_ACCUMULATED:
      XCP_0: [8213744, 8213743, 8213742, 8213743, N/A, N/A, N/A, N/A]
      XCP_1: [8213744, 8213743, 8213744, 8213744, N/A, N/A, N/A, N/A]
    LOW_UTILIZATION_ACCUMULATED:
      XCP_0: [8213744, 8213743, 8213742, 8213743, N/A, N/A, N/A, N/A]
      XCP_1: [8213744, 8213743, 8213744, 8213744, N/A, N/A, N/A, N/A]
    PROCHOT_VIOLATION_STATUS: NOT ACTIVE
    PPT_VIOLATION_STATUS: NOT ACTIVE
    SOCKET_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    VR_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    HBM_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_STATUS: N/A
    GFX_CLK_BELOW_HOST_LIMIT_POWER_VIOLATION_STATUS:
      XCP_0: [NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, N/A, N/A, N/
↪A, N/A]
      XCP_1: [NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, N/A, N/A, N/
↪A, N/A]
    GFX_CLK_BELOW_HOST_LIMIT_THERMAL_VIOLATION_STATUS:
      XCP_0: [NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, N/A, N/A, N/
↪A, N/A]
      XCP_1: [NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, NOT ACTIVE, N/A, N/A, N/
↪A, N/A]
    TOTAL_GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_STATUS:
      XCP_0: [ACTIVE, ACTIVE, ACTIVE, ACTIVE, N/A, N/A, N/A, N/A]
      XCP_1: [ACTIVE, ACTIVE, ACTIVE, ACTIVE, N/A, N/A, N/A, N/A]
    LOW_UTILIZATION_VIOLATION_STATUS:
      XCP_0: [ACTIVE, ACTIVE, ACTIVE, ACTIVE, N/A, N/A, N/A, N/A]
      XCP_1: [ACTIVE, ACTIVE, ACTIVE, ACTIVE, N/A, N/A, N/A, N/A]

```

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```

PROCHOT_VIOLATION_ACTIVITY: 0 %
PPT_VIOLATION_ACTIVITY: 0 %
SOCKET_THERMAL_VIOLATION_ACTIVITY: 0 %
VR_THERMAL_VIOLATION_ACTIVITY: 0 %
HBM_THERMAL_VIOLATION_ACTIVITY: 0 %
GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_ACTIVITY: N/A
GFX_CLK_BELOW_HOST_LIMIT_POWER_VIOLATION_ACTIVITY:
  XCP_0: [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
  XCP_1: [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
GFX_CLK_BELOW_HOST_LIMIT_THERMAL_VIOLATION_ACTIVITY:
  XCP_0: [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
  XCP_1: [0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A]
TOTAL_GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_ACTIVITY:
  XCP_0: [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/A]
  XCP_1: [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/A]
LOW_UTILIZATION_VIOLATION_ACTIVITY:
  XCP_0: [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/A]
  XCP_1: [100 %, 100 %, 100 %, 100 %, N/A, N/A, N/A, N/A]

```

- **The char arrays in the following structures have been changed.**

- amdsmi_vbios_info_t member build_date changed from AMDSMI_MAX_DATE_LENGTH to AMDSMI_MAX_STRING_LENGTH.
- amdsmi_dpm_policy_entry_t member policy_description changed from AMDSMI_MAX_NAME to AMDSMI_MAX_STRING_LENGTH.
- amdsmi_name_value_t member name changed from AMDSMI_MAX_NAME to AMDSMI_MAX_STRING_LENGTH.

- **Added new event notification types to amdsmi_evt_notification_type_t.**

The following values were added to the amdsmi_evt_notification_type_t enum:

- AMDSMI_EVT_NOTIF_EVENT_MIGRATE_START
- AMDSMI_EVT_NOTIF_EVENT_MIGRATE_END
- AMDSMI_EVT_NOTIF_EVENT_PAGE_FAULT_START
- AMDSMI_EVT_NOTIF_EVENT_PAGE_FAULT_END
- AMDSMI_EVT_NOTIF_EVENT_QUEUE_EVICTION
- AMDSMI_EVT_NOTIF_EVENT_QUEUE_RESTORE
- AMDSMI_EVT_NOTIF_EVENT_UNMAP_FROM_GPU
- AMDSMI_EVT_NOTIF_PROCESS_START
- AMDSMI_EVT_NOTIF_PROCESS_END

- **Added Power Cap to amd-smi monitor.**

- amd-smi monitor -p will display the power cap along with power.

```

$ amd-smi monitor -p
GPU POWER PWR_CAP
  0 148 W 750 W
  1 156 W 750 W

```

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```
2 153 W 750 W
...
```

- **Updated `amdsmi_bdf_t` in `amdsmi.h`.**
 - The `amdsmi_bdf_t` union was changed to have an identical unnamed struct for backwards compatibility
- **Updated `amdsmi_get_temp_metric` and `amdsmi_temperature_type_t` with new values.**
 - New values have added to `amdsmi_temperature_type_t` representing various baseboard and gpuboard temperature measures.
 - `amdsmi_get_temp_metric` API has also been updated to be able to take in and return the respective values for the new temperature types.
- **Modified error responses for `amd-smi set` and `amd-smi reset` to display AMD SMI’s error codes**
 - Error responses now include the explicit AMDSMI status code in square brackets (e.g., `[AMDSMI_STATUS_NOT_SUPPORTED]`) before the error message for each GPU, providing clear context on the type of failure.
 - This change is intended to help provide more context on the failure and why the failure occurred.
 - **How to interpret error codes:**
 - * If you see `[AMDSMI_STATUS_NOT_SUPPORTED]`, the device does not support the requested operation and no action is taken.
 - * If you see `[AMDSMI_STATUS_INVALID]`, user provided invalid parameters.
 - * If you see `[AMDSMI_STATUS_BUSY]`, device is busy and cannot process this request
 - * For other codes, refer to our documentation for details. [Link to enum `amdsmi_status_t` documentation.](#)
 - Example scenarios:
 - * **Navi System:**
Attempting to change partitions on a Navi system will result in a “not supported” response, since Navi does not support partitions.

```
$ sudo amd-smi set -M NPS2

*****WARNING*****

After changing memory (NPS) partition modes, users MUST restart
(reload) the AMD GPU driver. This command NO LONGER
↳AUTOMATICALLY
reloads the driver, see `amd-smi reset -h` and
`sudo amd-smi reset -r` for more information.

This change is intended to allow users the ability to control
↳when is
the best time to restart the AMD GPU driver, as it may not be
↳desired
to restart the AMD GPU driver immediately after changing the
memory (NPS) partition mode.

Please use `sudo amd-smi reset -r` AFTER successfully
```

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```

changing the memory (NPS) partition mode. A successful driver
↪reload is REQUIRED in order to complete updating ALL GPUs in the hive
↪to the requested partition mode.

*****REMINDER*****
In order to reload the AMD GPU driver, users MUST quit all GPU
workloads across all devices.

Do you accept these terms? [Y/N] y

GPU: 0
MEMORY_PARTITION: [AMDSMI_STATUS_NOT_SUPPORTED] Unable to set memory
↪partition to NPS2

GPU: 1
MEMORY_PARTITION: [AMDSMI_STATUS_NOT_SUPPORTED] Unable to set memory
↪partition to NPS2

```

* **MI3x System in DPX Mode:**

Restricting the power limit on a MI3x device in DPX mode will show “not supported” for logical devices, as only the primary device can accept the change.

```

$ sudo amd-smi set --power-cap 700
GPU: 0
POWERCAP: Successfully set power cap to 700W

GPU: 1
POWERCAP: [AMDSMI_STATUS_NOT_SUPPORTED] Unable to set power cap to 700W

GPU: 2
POWERCAP: Successfully set power cap to 700W

GPU: 3
POWERCAP: [AMDSMI_STATUS_NOT_SUPPORTED] Unable to set power cap to 700W
...

```

11.2.3 Removed

- **Removed unnecessary API, `amdsmi_free_name_value_pairs()`, from `amdsmi.h`**
 - This API is only used internally to free up memory from the python interface and does not need to be exposed to the User.
- **Removed unused definitions**
 - `AMDSMI_MAX_NAME`
 - `AMDSMI_256_LENGTH`
 - `AMDSMI_MAX_DATE_LENGTH`
 - `MAX_AMDSMI_NAME_LENGTH`
 - `AMDSMI_LIB_VERSION_YEAR`

- AMDSMI_DEFAULT_VARIANT
- AMDSMI_MAX_NUM_POWER_PROFILES
- AMDSMI_MAX_DRIVER_VERSION_LENGTH

- **Removed unused member year in struct amdsmi_version_t**

- **Removed amdsmi_io_link_type_t and replaced with amdsmi_link_type_t.**

- amdsmi_io_link_type_t is no longer needed as amdsmi_link_type_t is sufficient.
- Mapping from amdsmi_io_link_type_t to amdsmi_link_type_t is as follows:

```
AMDSMI_IOLINK_TYPE_UNDEFINED == AMDSMI_LINK_TYPE_INTERNAL
AMDSMI_IOLINK_TYPE_PCIEEXPRESS == AMDSMI_LINK_TYPE_PCIE
AMDSMI_IOLINK_TYPE_XGMI == AMDSMI_LINK_TYPE_XGMI
```

- amdsmi_link_type_t enum has changed, primarily the ordering of the PCI and XGMI types:

```
typedef enum {
    AMDSMI_LINK_TYPE_INTERNAL = 0,
    AMDSMI_LINK_TYPE_PCIE = 1,
    AMDSMI_LINK_TYPE_XGMI = 2,
    AMDSMI_LINK_TYPE_NOT_APPLICABLE = 3,
    AMDSMI_LINK_TYPE_UNKNOWN = 4
} amdsmi_link_type_t;
```

- Please note that this change will also affect amdsmi_link_metrics_t, where the link_type field changes from amdsmi_io_link_type_t to amdsmi_link_type_t:

```
typedef struct {
    uint32_t num_links;        //!< number of links
    struct _links {
        amdsmi_bdf_t bdf;      //!< bdf of the destination gpu
        uint32_t bit_rate;     //!< current link speed in Gb/s
        uint32_t max_bandwidth; //!< max bandwidth of the link in Gb/s
        amdsmi_link_type_t link_type; //!< type of the link
        uint64_t read;         //!< total data received for each link in KB
        uint64_t write;        //!< total data transfered for each link in KB
        uint64_t reserved[2];
    } links[AMDSMI_MAX_NUM_XGMI_PHYSICAL_LINK];
    uint64_t reserved[7];
} amdsmi_link_metrics_t;
```

- **Removed amdsmi_get_power_info_v2().**

- The amdsmi_get_power_info() has been unified and the v2 function is no longer needed/used.

- **Removed AMDSMI_EVT_NOTIF_RING_HANG event notification type in amdsmi_evt_notification_type_t.**

- **The amdsmi_get_gpu_vram_info now provides vendor names as a string.**

- amdsmi_vram_vendor_type_t enum structure was removed
- amdsmi_vram_info_t member named amdsmi_vram_vendor_type_t was changed to a character string
- amdsmi_get_gpu_vram_info now no longer requires decoding the vendor name as an enum

- **Removed backwards compatibility amdsmi_get_gpu_metrics_info()'s jpeg_activity or vcn_activity fields: use xcp_stats.jpeg_busy or xcp_stats.vcn_busy**

- Backwards compatibility is removed for jpeg_activity and vcn_activity fields, if the jpeg_busy or vcn_busy field is available.

* Reasons for this change:

- Providing both vcn_activity/jpeg_activity and XCP (partition) stats vcn_busy/jpeg_busy caused confusion for users about which field to use. By removing backward compatibility, it is easier to identify the relevant field.
- The jpeg_busy field increased in size (for supported ASICs), making backward compatibility unable to fully copy the structure into jpeg_activity.

See below for comparison of updated CLI outputs:

Original output:

```

$ amd-smi metric --usage
GPU: 0
  USAGE:
    GFX_ACTIVITY: 0 %
    UMC_ACTIVITY: 0 %
    MM_ACTIVITY: N/A
    VCN_ACTIVITY: [0 %, N/A, N/A, N/A]
    JPEG_ACTIVITY: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A]
    GFX_BUSY_INST:
      XCP_0: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_1: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_2: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_3: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_4: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_5: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_6: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_7: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
    JPEG_BUSY:
      XCP_0: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_1: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_2: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_3: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_4: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_5: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↵A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
      XCP_6: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↵
↵N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/

```

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```

↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
    XCP_7: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
    VCN_BUSY:
        XCP_0: [0 %, N/A, N/A, N/A]
        XCP_1: [0 %, N/A, N/A, N/A]
        XCP_2: [0 %, N/A, N/A, N/A]
        XCP_3: [0 %, N/A, N/A, N/A]
        XCP_4: [0 %, N/A, N/A, N/A]
        XCP_5: [0 %, N/A, N/A, N/A]
        XCP_6: [0 %, N/A, N/A, N/A]
        XCP_7: [0 %, N/A, N/A, N/A]

```

New output:

```

$ amd-smi metric --usage
GPU: 0
    USAGE:
        GFX_ACTIVITY: 0 %
        UMC_ACTIVITY: 0 %
        MM_ACTIVITY: N/A
        VCN_ACTIVITY: [N/A, N/A, N/A, N/A]
        JPEG_ACTIVITY: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A]
        GFX_BUSY_INST:
            XCP_0: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_1: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_2: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_3: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_4: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_5: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_6: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_7: [0 %, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
        JPEG_BUSY:
            XCP_0: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_1: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_2: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_3: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_4: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪
↪N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↪A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
            XCP_5: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, ↪

```

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11.2.7 Known issues

- `amd-smi monitor` does not work on guest systems

```
$ amd-smi monitor
AttributeError: 'Namespace' object has no attribute 'violation'
```

11.3 `amd_smi_lib` for ROCm 6.4.2

11.3.1 Added

- **Added Compute Unit Occupancy information per process**

Measuring compute units are the best way currently to determine gfx usage on a per process basis

- Added `cu_occupancy` field to `amdsmi_proc_info_t` structure in C & Python APIs, in minor version update
- Added `CU_OCCUPANCY` to `amd-smi process` output.
- Added `CU%` to `amd-smi monitor -q`

- **Added support to get GPU Board voltage.**

```
$ amd-smi metric --voltage
GPU: 0
    VOLTAGE:
        VDDBOARD: 52536 mV
        ...
```

- **Added new firmware `PLDM_BUNDLE`.**

- `amd-smi firmware` can now show the PLDM Bundle on supported systems.

- **Added `amd-smi ras --afid --cper-file <file_path>` to decode CPER records**

- Python and C have added the `amdsmi_get_afids_from_cper()` to decode

11.3.2 Changed

- **Padded `asic_serial` in `amdsmi_get_asic_info` with 0s.**

- **Renamed fields `COMPUTE_PARTITION` to `ACCELERATOR_PARTITION` in CLI call `amd-smi --partition`.**

- We are changing the field named `COMPUTE_PARTITION` to `ACCELERATOR_PARTITION`.
- API and associated struct naming will remain the same
- Reason(s) for this change:
 - * Align with host AMD SMI's static `--partition` field naming
 - * Align with naming seen in `amd-smi partition`

Previous Output:

```
$ amd-smi static --partition
GPU: 0
PARTITION:
    COMPUTE_PARTITION: SPX
    MEMORY_PARTITION: NPS1
    PARTITION_ID: 0
```

New Output:

```
$ amd-smi static --partition
GPU: 0
PARTITION:
  ACCELERATOR_PARTITION: SPX
  MEMORY_PARTITION: NPS1
  PARTITION_ID: 0
```

11.3.3 Removed

- N/A

11.3.4 Optimized

- N/A

11.3.5 Resolved issues

- **Corrected VRAM memory calculation in `amdsmi_get_gpu_process_list`.**
 - Previously, the VRAM memory usage reported by `amdsmi_get_gpu_process_list` was inaccurate and calculated using KB vs KiB.

11.3.6 Upcoming changes

- N/A

11.3.7 Known issues

- N/A

11.4 `amd_smi_lib` for ROCm 6.4.1

11.4.1 Added

- **Added dumping CPER entries from RAS tool `amdsmi_get_gpu_cper_entries()` to Python & C APIs.**
 - CPER entries consist of `amdsmi_cper_hdr_t`

```
typedef struct {
    char          signature[4];          /* "CPER" */
    uint16_t      revision;
    uint32_t      signature_end;        /* 0xFFFFFFFF */
    uint16_t      sec_cnt;
    amdsmi_cper_sev_t error_severity;
    //valid_bits_t  valid_bits;
    //uint32_t      valid_mask;
    amdsmi_cper_valid_bits_t cper_valid_bits;
    uint32_t      record_length;        /* Total size of CPER Entry */
    amdsmi_cper_timestamp_t timestamp;
    char          platform_id[16];
    amdsmi_cper_guid_t partition_id;    /* Reserved */
    char          creator_id[16];
```

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```

    amdsmi_cper_guid_t    notify_type;          /* CMC, MCE, can use amdsmi_cper_
↳notify_type_t to decode*/
    char                  record_id[8];        /* Unique CPER Entry ID */
    uint32_t              flags;               /* Reserved */
    uint64_t              persistence_info;    /* Reserved */
    uint8_t               reserved[12];       /* Reserved */
} amdsmi_cper_hdr_t;

```

- Dumping CPER entires is also enabled in the CLI interface via `sudo amd-smi ras --cper`

```

$ sudo amd-smi ras --cper
Dumping CPER file header entries for GPU 0:
"0": {
  "error_severity": "non_fatal_corrected",
  "notify_type": "CMC",
  "timestamp": "2025/04/08 18:23:44",
  "signature": "CPER",
  "revision": 256,
  "signature_end": "0xffffffff",
  "sec_cnt": 1,
  "record_length": 472,
  "platform_id": "0x1002:0x74A2",
  "creator_id": "amdgpu",
  "record_id": "5:1",
  "flags": 0,
  "persistence_info": 0
}

```

- Added `amdsmi_get_gpu_busy_percent` to the C API.

- This function retrieves the GPU busy percentage from the `gpu_busy_percent` sysfs file.

11.4.2 Changed

- Modified VRAM display for `amd-smi monitor -v`.

- Added free VRAM and VRAM percentage.

```

$ amd-smi monitor -v
GPU  VRAM_USED  VRAM_FREE  VRAM_TOTAL  VRAM%
0    174 MB    16011 MB   16185 MB    0.01 %
1    78 MB     347 MB    425 MB      0.18 %
...

```

11.4.3 Removed

- N/A

11.4.4 Optimized

- Improved load times for CLI commands when the GPU has multiple partitions.

11.4.5 Resolved issues

- **Fixed partition enumeration** - `amd-smi list -e`, `amdsmi_get_gpu_enumeration_info()`'s `amdsmi_enumeration_info_t` `drm_card` and `drm_render` fields

Previously, partitions incorrectly reflected the primary node (1st GPU) and showed the DRM Render Minor as `renderD128`. Partition nodes mirrored `renderD128`'s information, which was incorrect. See the “*Previous Outputs in CPX*” example below.

Device enumeration was updated to correctly map DRM Render Minor paths. See the “*Corrected Outputs in CPX*” example below.

These changes impact what information is readable/writable for the partition nodes.

Example: Previous Outputs in CPX

```
$ amd-smi list -e
GPU: 0
  BDF: 0000:0c:00.0
  UUID: <Redacted>
  KFD_ID: 18421
  NODE_ID: 2
  PARTITION_ID: 0
  RENDER: renderD128
  CARD: card0
  HSA_ID: 2
  HIP_ID: 0
  HIP_UUID: <Redacted>

GPU: 1
  BDF: 0000:0c:00.1
  UUID: <Redacted>
  KFD_ID: 48116
  NODE_ID: 3
  PARTITION_ID: 1
  RENDER: N/A
  CARD: N/A
  HSA_ID: 3
  HIP_ID: 1
  HIP_UUID: GPU-<Redacted>

...

```

```
$ amd-smi monitor
GPU POWER GPU_T MEM_T GFX_CLK GFX% MEM% ENC% DEC% VRAM_USAGE
0 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
1 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
2 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
3 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
4 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
5 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
6 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
7 201 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
8 210 W 46 °C 42 °C 2104 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB

...

```

Example: Corrected outputs in CPX

```

$ amd-smi list -e
GPU: 0
  BDF: 0000:0c:00.0
  UUID: <Redacted>
  KFD_ID: 18421
  NODE_ID: 2
  PARTITION_ID: 0
  RENDER: renderD128
  CARD: card0
  HSA_ID: 2
  HIP_ID: 0
  HIP_UUID: GPU-<Redacted>

GPU: 1
  BDF: 0000:0c:00.1
  UUID: <Redacted>
  KFD_ID: 48116
  NODE_ID: 3
  PARTITION_ID: 1
  RENDER: renderD129
  CARD: card1
  HSA_ID: 3
  HIP_ID: 1
  HIP_UUID: GPU-<Redacted>

...

```

```

$ amd-smi monitor
GPU POWER GPU_T MEM_T GFX_CLK GFX% MEM% ENC% DEC% VRAM_USAGE
0 202 W 46 °C 42 °C 2107 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB
1 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
2 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
3 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
4 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
5 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
6 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
7 N/A N/A N/A N/A N/A N/A N/A N/A N/A 0.5/ 24.0 GB
8 210 W 46 °C 42 °C 2104 MHz 0 % 0 % N/A 0 % 0.3/192.0 GB

...

```

11.4.6 Upcoming changes

- N/A

11.4.7 Known issues

- N/A

11.5 amd_smi_lib for ROCm 6.4.0

11.5.1 Added

- Added enumeration mapping `amdsmi_get_gpu_enumeration_info()` to Python & C APIs.

- Enumeration mapping consists of `amdsmi_enumeration_info_t`

```
typedef struct {
    uint32_t drm_render; // the render node under /sys/class/drm/renderD*
    uint32_t drm_card;   // the graphic card device under /sys/class/drm/card*
    uint32_t hsa_id;     // the HSA enumeration ID
    uint32_t hip_id;     // the HIP enumeration ID
    char hip_uuid[AMDSMI_MAX_STRING_LENGTH]; // the HIP unique identifier
} amdsmi_enumeration_info_t;
```

- The mapping is also enabled in the CLI interface via `amd-smi list -e`

```
$ amd-smi list -e
GPU: 0
    BDF: 0000:23:00.0
    UUID: XXXXXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
    KFD_ID: 45412
    NODE_ID: 1
    PARTITION_ID: 0
    RENDER: renderD128
    CARD: card0
    HSA_ID: 1
    HIP_ID: 0
    HIP_UUID: GPU-XXXXXXXXXXXXXXXXXXXX
```

- **Added dynamic virtualization mode detection.**

- Added new C and Python API `amdsmi_get_gpu_virtualization_mode`
- Added new C and Python enum `amdsmi_virtualization_mode_t`

- **Added TVIOL_ACTIVE to `amd-smi monitor`.**

- Added temperature violation active or not status to `amd-smi monitor`. TVIOL_ACTIVE will be displayed as below:
 - * True if active
 - * False if not active
 - * N/A if not supported.

Example CLI output:

```
$ amd-smi monitor --viol
GPU  PVIOL  TVIOL  TVIOL_ACTIVE  PHOT_TVIOL  VR_TVIOL  HBM_TVIOL
0    100 %   1 %      True           0 %          0 %          0 %
1    100 %   0 %     False           0 %          0 %          0 %
2    100 %   0 %     False           0 %          0 %          0 %
3    100 %   0 %     False           0 %          0 %          0 %
4    100 %   0 %     False           0 %          0 %          0 %
5    100 %   3 %      True           0 %          0 %          0 %
6    100 %   0 %     False           0 %          0 %          0 %
7    100 %   0 %     False           0 %          0 %          0 %
```

- **Added support for GPU metrics 1.7 to `amdsmi_get_gpu_metrics_info()`.**

Updated `amdsmi_get_gpu_metrics_info()` and structure `amdsmi_gpu_metrics_t` to include new fields for XGMI Link Status, graphics clocks below host limit (per XCP), and VRAM max bandwidth:

- uint64_t vram_max_bandwidth - VRAM max bandwidth at max memory clock (GB/s)
- uint16_t xgmi_link_status[MAX_NUM_XGMI_LINKS] - XGMI link status, 1=Up 0=Down
- uint64_t gfx_below_host_limit_acc[MAX_NUM_XCC] - graphics clocks below host limit (per XCP) accumulators. Used for graphic clk below host limit violation status.

- **Added new API `amdsmi_get_gpu_xgmi_link_status()` and CLI `amd-smi xgmi --link-status`**

New API is defined as:

```
typedef enum {
    AMDSMI_XGMI_LINK_DOWN,      ///< The XGMI Link is down
    AMDSMI_XGMI_LINK_UP,       ///< The XGMI Link is up
    AMDSMI_XGMI_LINK_DISABLE,  ///< The XGMI Link is disabled
} amdsmi_xgmi_link_status_type_t;

typedef struct {
    uint32_t total_links;      ///< The total links in the status array
    amdsmi_xgmi_link_status_type_t status[AMDSMI_MAX_NUM_XGMI_LINKS];
    uint64_t reserved[7];
} amdsmi_xgmi_link_status_t;

amdsmi_status_t amdsmi_get_gpu_xgmi_link_status(amdsmi_processor_handle processor_
↪handle, amdsmi_xgmi_link_status_t *link_status)
```

Example CLI output:

```
$ amd-smi xgmi --link-status

XGMI LINK STATUS:
   bdf          link_status
GPU0  0000:08:00.0  U  U  U  U  D  U  D  X
GPU1  0000:44:00.0  U  U  U  U  D  U  D  X
...

* U:Up D:Down X:Disabled
```

- **Added fclk and socclk info to `amd-smi metric -c/--clock`.**

- fclk and socclk information such as min and max clock have been added to the metric command, in line with all the other clocks.

```
$ amd-smi metric -c -g 1
...
    FCLK_0:
        CLK: 2301 MHz
        MIN_CLK: 601 MHz
        MAX_CLK: 2301 MHz
        CLK_LOCKED: N/A
        DEEP_SLEEP: DISABLED
    SOCCLK_0:
        CLK: 1500 MHz
        MIN_CLK: 500 MHz
        MAX_CLK: 1500 MHz
        CLK_LOCKED: N/A
        DEEP_SLEEP: DISABLED
```

- Added new command **amd-smi set -c/--clock-level**.

- This new command sets the performance level of the selected clock on the desired GPUs.
- The command can accept a range of acceptable levels, but will not set the level when a level is beyond the number of frequency levels as show in `amd-smi static -C/--clock`.

```
$ sudo amd-smi set -c sclk 5 6
GPU: 0
    CLK_LEVEL: Successfully changed sclk perf level(s) to 5, 6

GPU: 1
    CLK_LEVEL: level(s) 5, 6 is/are greater than performance levels supported.
    ↪for device
```

- Added new command **amd-smi static -C/--clock**.

- This new command displays the clock frequency performance levels for the selected GPUs and clocks.

```
$ amd-smi static --clock all -g 0
GPU: 0
    CLOCK:
        SYS:
            CURRENT LEVEL: 2
            FREQUENCY_LEVELS:
                0: 300 MHz
                1: 904 MHz
                2: 1165 MHz
                3: 1360 MHz
                4: 1440 MHz
                5: 1544 MHz
                6: 1627 MHz
                7: 1720 MHz
                8: 1800 MHz
        MEM:
            CURRENT LEVEL: 0
            FREQUENCY_LEVELS:
                0: 167 MHz
        DF:
            CURRENT LEVEL: 0
            FREQUENCY_LEVELS:
                0: 1400 MHz
        SOC:
            CURRENT LEVEL: 0
            FREQUENCY_LEVELS:
                0: 302 MHz
        DCEF: N/A
        VCLK0: N/A
        VCLK1: N/A
        DCLK0: N/A
        DCLK1: N/A
```

11.5.2 Changed

- **AMDSMI Library Version number to reflect changes in backwards compatibility.**
 - Removed Year from AMDSMI Library version number.
 - Version changed from 25.2.0.0 (Year.Major.Minor.Patch) to 25.2.0 (Major.Minor.Patch)
 - Removed year in all version references
- **Removed initialization requirements for `amdsmi_get_lib_version()` and added `amdsmi_get_rocm_version()` to the python API & CLI.**
- **Added `amdsmi_get_power_info_v2()` with `sensor_ind`.**
 - Python API now accepts `sensor_ind` as an optional argument, does not impact previous usage
- **Deprecated enum `AMDSMI_NORMAL_STRING_LENGTH` in favor of `AMDSMI_MAX_STRING_LENGTH`.**
- **Changed to use thread local mutex by default.**
 - Most sysfs reads do not require cross-process level mutex, and writes to sysfs should be protected by the kernel already.
 - Users can still switch to the old behavior by setting the environment variable `AMDSMI_MUTEX_CROSS_PROCESS=1`.
- **Changed `amdsmi_vram_vendor_type_t` enum names impacting `amdsmi_vram_info_t` structure.**
This also change impacts usage of the `vram_vendor` output of `amdsmi_get_gpu_vram_info()`
- **Changed `amdsmi_nps_caps_t` struct impacting `amdsmi_memory_partition_config_t`, `amdsmi_accelerator_partition_t`, `amdsmi_accelerator_partition_profile_config_t`.**
Functions affected by struct change are:
 - `amdsmi_get_gpu_memory_partition_config()`
 - `amdsmi_get_gpu_accelerator_partition_profile()`
 - `amdsmi_get_gpu_accelerator_partition_profile_config()`
- **Corrected CLI CPU argument name.**
 - `--cpu-pwr-svi-telemetry-rails` to `--cpu-pwr-svi-telemetry-rails`
- **Added `amdgpu` driver version and `amd_hsmp` driver version to `amd-smi version` command.**
 - The `amd-smi version` command can now also display the `amdgpu` driver version using the `-g` flag.
 - The `amd_hsmp` driver version can also be displayed using the `-c` flag.
 - The new default for the `version` command is to display all the version information, including both `amdgpu` and `amd_hsmp` driver versions.

```

$ amd-smi version
AMDSMI Tool: 24.7.1+b446d6c-dirty | AMDSMI Library version: 24.7.2.0 | ROCm
↪version: N/A | amdgpu version: 6.10.10 | amd_hsmp version: 2.2

$ amd-smi version -g
AMDSMI Tool: 24.7.1+b446d6c-dirty | AMDSMI Library version: 24.7.2.0 | ROCm
↪version: N/A | amdgpu version: 6.10.10

$ amd-smi version -c
AMDSMI Tool: 24.7.1+b446d6c-dirty | AMDSMI Library version: 24.7.2.0 | ROCm
↪version: N/A | amd_hsmp version: 2.2

```

- All `amd-smi set` and `amd-smi reset` options are now mutually exclusive.
 - Users can only use one set option at a time now.
- Python API for `amdsmi_get_energy_count()` will change the name for the power field to `energy_accumulator`.
- Added violation status output for Graphics Clock Below Host Limit to our CLI: `amdsmi_get_violation_status()`, `amd-smi metric --throttle`, and `amd-smi monitor --violation`.

Only available for MI300+ ASICs.

Users can retrieve violation status' through either our Python or C++ APIs.

Additionally, we have added capability to view these outputs conveniently through `amd-smi metric --throttle` and `amd-smi monitor --violation`.

Example outputs are listed below (below is for reference, output is subject to change):

```
$ amd-smi monitor --violation
GPU  PVIOL  TVIOL  TVIOL_ACTIVE  PHOT_TVIOL  VR_TVIOL  HBM_TVIOL  GFX_CLKVIOL
0    0 %    0 %           False        0 %        0 %        0 %        0 %
1    0 %    0 %           False        0 %        0 %        0 %        0 %
...
```

```
$ amd-smi metric --throttle
GPU: 0
  THROTTLE:
    ACCUMULATION_COUNTER: 11240028
    PROCHOT_ACCUMULATED: 0
    PPT_ACCUMULATED: 0
    SOCKET_THERMAL_ACCUMULATED: 0
    VR_THERMAL_ACCUMULATED: 0
    HBM_THERMAL_ACCUMULATED: 0
    GFX_CLK_BELOW_HOST_LIMIT_ACCUMULATED: N/A
    PROCHOT_VIOLATION_STATUS: NOT ACTIVE
    PPT_VIOLATION_STATUS: NOT ACTIVE
    SOCKET_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    VR_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    HBM_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_STATUS: N/A
    PROCHOT_VIOLATION_ACTIVITY: 0 %
    PPT_VIOLATION_ACTIVITY: 0 %
    SOCKET_THERMAL_VIOLATION_ACTIVITY: 0 %
    VR_THERMAL_VIOLATION_ACTIVITY: 0 %
    HBM_THERMAL_VIOLATION_ACTIVITY: 0 %
    GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_ACTIVITY: 0 %

GPU: 1
  THROTTLE:
    ACCUMULATION_COUNTER: 11238232
    PROCHOT_ACCUMULATED: 0
    PPT_ACCUMULATED: 0
    SOCKET_THERMAL_ACCUMULATED: 0
    VR_THERMAL_ACCUMULATED: 0
    HBM_THERMAL_ACCUMULATED: 0
    GFX_CLK_BELOW_HOST_LIMIT_ACCUMULATED: 0
    PROCHOT_VIOLATION_STATUS: NOT ACTIVE
```

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```

PPT_VIOLATION_STATUS: NOT ACTIVE
SOCKET_THERMAL_VIOLATION_STATUS: NOT ACTIVE
VR_THERMAL_VIOLATION_STATUS: NOT ACTIVE
HBM_THERMAL_VIOLATION_STATUS: NOT ACTIVE
GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_STATUS: NOT ACTIVE
PROCHOT_VIOLATION_ACTIVITY: 0 %
PPT_VIOLATION_ACTIVITY: 0 %
SOCKET_THERMAL_VIOLATION_ACTIVITY: 0 %
VR_THERMAL_VIOLATION_ACTIVITY: 0 %
HBM_THERMAL_VIOLATION_ACTIVITY: 0 %
GFX_CLK_BELOW_HOST_LIMIT_VIOLATION_ACTIVITY: 0 %
...

```

- Updated API `amdsmi_get_violation_status()` structure and CLI `amdsmi_violation_status_t` to include GFX Clk below host limit

Updated structure `amdsmi_violation_status_t`:

```

typedef struct {
    ...
    uint64_t acc_gfx_clk_below_host_limit; ///< Current graphic clock below host_
    ↪limit count; Max uint64 means unsupported
    ...
    uint64_t per_gfx_clk_below_host_limit; ///< Graphics clock below host limit_
    ↪violation % (greater than 0% is a violation); Max uint64 means unsupported
    ...
    uint8_t active_gfx_clk_below_host_limit; ///< Graphics clock below host limit_
    ↪violation; 1 = active 0 = not active; Max uint8 means unsupported
    ...
} amdsmi_violation_status_t;

```

- Updated API `amdsmi_get_gpu_vram_info()` structure and CLI `amd-smi static --vram`

Updated structure `amdsmi_vram_info_t`:

```

typedef struct {
    amdsmi_vram_type_t vram_type;
    amdsmi_vram_vendor_type_t vram_vendor;
    uint64_t vram_size;
    uint32_t vram_bit_width;
    uint64_t vram_max_bandwidth; ///< The VRAM max bandwidth at current memory_
    ↪clock (GB/s)
    uint64_t reserved[4];
} amdsmi_vram_info_t;

amdsmi_status_t amdsmi_get_gpu_vram_info(amdsmi_processor_handle processor_handle,
    ↪amdsmi_vram_info_t *info)

```

Example CLI output:

```

$ amd-smi static --vram
GPU: 0
  VRAM:
    TYPE: GDDR6
    VENDOR: N/A

```

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```

SIZE: 16368 MB
BIT_WIDTH: 256
MAX_BANDWIDTH: 1555 GB/s
GPU: 1
  VRAM:
    TYPE: GDDR6
    VENDOR: N/A
    SIZE: 30704 MB
    BIT_WIDTH: 256
    MAX_BANDWIDTH: 1555 GB/s
...

```

• **Changed amd-smi partition --accelerator & amdsmi_get_gpu_accelerator_partition_profile_config() detect users running without root/sudo permissions**

- Updated `amdsmi_get_gpu_accelerator_partition_profile_config()` to return `AMDSMI_STATUS_NO_PERM` immediately if users run without root/sudo permissions.
- Updated `amd-smi partition --accelerator` to provide a warning for users without root/sudo permissions (see example below, *output subject to change*).

```

$ amd-smi partition --accelerator

ACCELERATOR_PARTITION_PROFILES:

*****
** WARNING:
** ACCELERATOR_PARTITION_PROFILES requires sudo/root permissions to run.
** Please run the command with sudo permissions to get accurate results.
*****

GPU_ID  PROFILE_INDEX  MEMORY_PARTITION_CAPS  ACCELERATOR_TYPE  PARTITION_ID  NUM_PARTITIONS  NUM_RESOURCES  RESOURCE_INDEX  RESOURCE_TYPE  RESOURCE_INSTANCES  RESOURCES_SHARED
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪
↪ N/A   N/A           N/A                   N/A               0              ↪

```

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```

↪ N/A          N/A          N/A          N/A          N/A
↪   N/A
N/A   N/A          N/A          N/A          0
↪ N/A          N/A          N/A          N/A          N/A
↪   N/A

ACCELERATOR_PARTITION_RESOURCES:
RESOURCE_INDEX RESOURCE_TYPE RESOURCE_INSTANCES RESOURCES_SHARED
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A
N/A            N/A            N/A              N/A

Legend:
* = Current mode

```

- Changed `amd-smi partition --current`, `amd-smi partition --accelerator`, and `amdsmi_get_gpu_accelerator_partition_profile()` to display partition ID for each individual partition

- Host will continue to display in the full array format, they do not display the individual partitions as Baremetal/Guest setups.
- Baremetal and Guest MI3x setups will change to reflect each individual partition ID, now provided in `partition_id[0]` location (as seen in other `amd-smi` CLI commands).
- This change was needed for BM/Guest setups due to other related partition outputs seen in (`amd-smi list` and `amd-smi static --partition`) and individual logical partition devices displayed.

Previous output:

```

$ amd-smi partition --current

CURRENT_PARTITION:
GPU_ID MEMORY ACCELERATOR_TYPE ACCELERATOR_PROFILE_INDEX PARTITION_ID
0      NPS1  CPX                3                        0,1,2,3,4,5,6,7
1      NPS1  CPX                3                        N/A
2      NPS1  CPX                3                        N/A
3      NPS1  CPX                3                        N/A
4      NPS1  CPX                3                        N/A
5      NPS1  CPX                3                        N/A
6      NPS1  CPX                3                        N/A
7      NPS1  CPX                3                        N/A
8      NPS1  CPX                3                        0,1,2,3,4,5,6,7
9      NPS1  CPX                3                        N/A
10     NPS1  CPX                3                        N/A
...

```

New output:

```

amd-smi partition --current
CURRENT_PARTITION:
GPU_ID  MEMORY  ACCELERATOR_TYPE  ACCELERATOR_PROFILE_INDEX  PARTITION_ID
0       NPS1    CPX               3                           0
1       NPS1    CPX               3                           1
2       NPS1    CPX               3                           2
3       NPS1    CPX               3                           3
4       NPS1    CPX               3                           4
5       NPS1    CPX               3                           5
6       NPS1    CPX               3                           6
7       NPS1    CPX               3                           7
8       NPS1    CPX               3                           0
9       NPS1    CPX               3                           1
10      NPS1    CPX               3                           2
...

```

11.5.3 Removed

- **Removed GFX_BUSY_ACC from `amd-smi metric --usage`.**
 - Displaying GFX_BUSY_ACC does not provide helpful outputs for users.

Old output:

```

$ amd-smi metric --usage
GPU: 0
  USAGE:
    GFX_ACTIVITY: 0 %
    UMC_ACTIVITY: 0 %
    MM_ACTIVITY: N/A
    VCN_ACTIVITY: [0 %, 0 %, 0 %, 0 %]
    JPEG_ACTIVITY: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0
→%, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0
→ 0 %, 0 %, 0 %, 0 %]
    GFX_BUSY_INST:
      XCP_0: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %]
    JPEG_BUSY:
      XCP_0: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0
→%, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0
→ 0 %, 0 %, 0 %]
    VCN_BUSY:
      XCP_0: [0 %, 0 %, 0 %, 0 %]
    GFX_BUSY_ACC:
      XCP_0: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
...

```

New Output:

```

$ amd-smi metric --usage
GPU: 0
  USAGE:
    GFX_ACTIVITY: 0 %
    UMC_ACTIVITY: 0 %
    MM_ACTIVITY: N/A

```

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↪123 PB	1.123 PB	1.123 PB	1.123 PB	1.123 PB	1.123 PB	1.123 PB	
Write					229.1 MB	N/A	↪
↪229.1 MB	229.1 MB	229.1 MB	229.1 MB	229.1 MB	229.1 MB	229.1 MB	
GPU2	0000:46:00.0	32 Gb/s	512 Gb/s	XGMI			
Read					1.123 PB	1.123 PB	N/
↪A	1.123 PB	1.123 PB	1.123 PB	1.123 PB	1.123 PB	1.123 PB	
Write					229.1 MB	229.1 MB	N/
↪A	229.1 MB	229.1 MB	229.1 MB	229.1 MB	229.1 MB	229.1 MB	
...							

11.5.5 Resolved issues

- Fixed `amd-smi static --partition` for guest systems with MIx ASICs being unable to run
- Fixed `amdsmi_get_gpu_asic_info` and `amd-smi static --asic` not displaying graphics version properly for MI2x, MI1x or Navi 3x ASICs.

Before on MI100:

```
$ amd-smi static --asic | grep TARGET_GRAPHICS_VERSION
TARGET_GRAPHICS_VERSION: gfx9008
TARGET_GRAPHICS_VERSION: gfx9008
```

After on MI100:

```
$ amd-smi static --asic | grep TARGET_GRAPHICS_VERSION
TARGET_GRAPHICS_VERSION: gfx908
TARGET_GRAPHICS_VERSION: gfx908
```

- Fixed `amd-smi static --partition` for guest systems with MIx ASICs being unable to run

11.5.6 Upcoming changes

- Deprecation in ROCm 7.0 of the `AMDSMI_LIB_VERSION_YEAR` enum and API fields.
- Deprecation in ROCm 7.0 of the `pasid` field within struct `amdsmi_process_info_t`

11.5.7 Known issues

- **AMD SMI only reports 63 GPU devices when setting CPX on all 8 GPUs**
When setting CPX as a partition mode, there is a DRM node limitation of 64. This is a known limitation of the Linux kernel, not the driver. Other drivers, such as those using PCIe space (e.g., `ast`), may be occupying the necessary DRM nodes. The number of DRM nodes used can be checked via `ls /sys/class/drm`

– References to kernel changes:

- * [Updates to number of node](#)
- * [Identification of node type](#)

Options are as follows:

1) *Workaround - removing other devices using DRM nodes*

Recommended steps for removing unnecessary drivers:

- Unload `amdgpu` - `sudo rmmmod amdgpu`
- Remove unnecessary driver(s) - ex. `sudo rmmmod ast`

- c. Reload amgpu - `sudo modprobe amdgpu`
- d. Confirm `amd-smi list` reports all nodes (this can vary per MI ASIC)

2) *Update your OS' kernel*

3) *Building and installing your own kernel*

11.6 amd_smi_lib for ROCm 6.3.1

11.6.1 Added

11.6.2 Changed

- **Changed `amd-smi monitor`: No longer display `ENC_CLOCK/DEC_CLOCK` but `VCLOCK` and `DCLOCK`.**

Due to fix mentioned in Resolved Issues, this change was needed.

Reason: Navi products use `vclk` and `dclk` for both encode and decode. On MI products, only decode is supported.

Before:

```
$ amd-smi monitor -n -d
GPU  ENC_UTIL  ENC_CLOCK  DEC_UTIL  DEC_CLOCK
0    0.0 %    29 MHz    N/A      22 MHz
1    0.0 %    29 MHz    N/A      22 MHz
2    0.0 %    29 MHz    N/A      22 MHz
3    0.0 %    29 MHz    N/A      22 MHz
4    0.0 %    29 MHz    N/A      22 MHz
5    0.0 %    29 MHz    N/A      22 MHz
6    0.0 %    29 MHz    N/A      22 MHz
7    0.0 %    29 MHz    N/A      22 MHz
```

After:

```
$ amd-smi monitor -n -d
GPU  ENC_UTIL  DEC_UTIL  VCLOCK  DCLOCK
0    N/A      0.0 %    29 MHz  22 MHz
1    N/A      0.0 %    29 MHz  22 MHz
2    N/A      0.0 %    29 MHz  22 MHz
3    N/A      0.0 %    29 MHz  22 MHz
4    N/A      0.0 %    29 MHz  22 MHz
5    N/A      0.0 %    29 MHz  22 MHz
6    N/A      0.0 %    29 MHz  22 MHz
7    N/A      0.0 %    29 MHz  22 MHz
```

11.6.3 Removed

11.6.4 Optimized

11.6.5 Resolved issues

- **Fixed `amd-smi monitor`'s encode/decode: `ENC_UTIL`, `DEC_UTIL`, and now associate `VCLOCK/DCLOCK` with both.**

Navi products use `vclk` and `dclk` for both encode and decode. On MI products, only decode is supported.

Navi products cannot support displaying `ENC_UTIL %` at this time.

Before:

```
$ amd-smi monitor -n -d
GPU  ENC_UTIL  ENC_CLOCK  DEC_UTIL  DEC_CLOCK
0    0.0 %    29 MHz    N/A      22 MHz
1    0.0 %    29 MHz    N/A      22 MHz
2    0.0 %    29 MHz    N/A      22 MHz
3    0.0 %    29 MHz    N/A      22 MHz
4    0.0 %    29 MHz    N/A      22 MHz
5    0.0 %    29 MHz    N/A      22 MHz
6    0.0 %    29 MHz    N/A      22 MHz
7    0.0 %    29 MHz    N/A      22 MHz
```

After:

```
$ amd-smi monitor -n -d
GPU  ENC_UTIL  DEC_UTIL  VCLOCK  DCLOCK
0    N/A      0.0 %    29 MHz  22 MHz
1    N/A      0.0 %    29 MHz  22 MHz
2    N/A      0.0 %    29 MHz  22 MHz
3    N/A      0.0 %    29 MHz  22 MHz
4    N/A      0.0 %    29 MHz  22 MHz
5    N/A      0.0 %    29 MHz  22 MHz
6    N/A      0.0 %    29 MHz  22 MHz
7    N/A      0.0 %    29 MHz  22 MHz
```

11.6.6 Upcoming changes

11.6.7 Known issues

11.7 amd_smi_lib for ROCm 6.3.0

11.7.1 Added

- **Added support for `amd-smi metric --ecc` & `amd-smi metric --ecc-blocks` on Guest VMs.**
Guest VMs now support getting current ECC counts and ras information from the Host cards.
- **Added support for GPU metrics 1.6 to `amdsmi_get_gpu_metrics_info()`.**
Updated `amdsmi_get_gpu_metrics_info()` and structure `amdsmi_gpu_metrics_t` to include new fields for PVIOL / TVIOL, XCP (Graphics Compute Partitions) stats, and `pcie_lc_perf_other_end_recovery`:
 - `uint64_t accumulation_counter` - used for all throttled calculations
 - `uint64_t prohot_residency_acc` - Processor hot accumulator
 - `uint64_t ppt_residency_acc` - Package Power Tracking (PPT) accumulator (used in PVIOL calculations)
 - `uint64_t socket_thm_residency_acc` - Socket thermal accumulator - (used in TVIOL calculations)
 - `uint64_t vr_thm_residency_acc` - Voltage Rail (VR) thermal accumulator
 - `uint64_t hbm_thm_residency_acc` - High Bandwidth Memory (HBM) thermal accumulator
 - `uint16_t num_partition` - corresponds to the current total number of partitions
 - `struct amdgpu_xcp_metrics_t xcp_stats[MAX_NUM_XCP]` - for each partition associated with current GPU, provides gfx busy & accumulators, jpeg, and decoder (VCN) engine utilizations
 - * `uint32_t gfx_busy_inst[MAX_NUM_XCC]` - graphic engine utilization (%)

- * uint16_t jpeg_busy[MAX_NUM_JPEG_ENGS] - jpeg engine utilization (%)
 - * uint16_t vcn_busy[MAX_NUM_VCNS] - decoder (VCN) engine utilization (%)
 - * uint64_t gfx_busy_acc[MAX_NUM_XCC] - graphic engine utilization accumulated (%)
- uint32_t pcie_lc_perf_other_end_recovery - corresponds to the pcie other end recovery counter
- **Added new violation status outputs and APIs: `amdsmi_status_t amsmi_get_violation_status()`, `amd-smi metric --throttle`, and `amd-smi monitor --violation`.**

Only available for MI300+ ASICs.

Users can now retrieve violation status' through either our Python or C++ APIs. Additionally, we have added capability to view these outputs conveniently through `amd-smi metric --throttle` and `amd-smi monitor --violation`.

Example outputs are listed below (below is for reference, output is subject to change):

```
$ amd-smi metric --throttle
GPU: 0
  THROTTLE:
    ACCUMULATION_COUNTER: 3808991
    PROCHOT_ACCUMULATED: 0
    PPT_ACCUMULATED: 585613
    SOCKET_THERMAL_ACCUMULATED: 2190
    VR_THERMAL_ACCUMULATED: 0
    HBM_THERMAL_ACCUMULATED: 0
    PROCHOT_VIOLATION_STATUS: NOT ACTIVE
    PPT_VIOLATION_STATUS: NOT ACTIVE
    SOCKET_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    VR_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    HBM_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    PROCHOT_VIOLATION_ACTIVITY: 0 %
    PPT_VIOLATION_ACTIVITY: 0 %
    SOCKET_THERMAL_VIOLATION_ACTIVITY: 0 %
    VR_THERMAL_VIOLATION_ACTIVITY: 0 %
    HBM_THERMAL_VIOLATION_ACTIVITY: 0 %

GPU: 1
  THROTTLE:
    ACCUMULATION_COUNTER: 3806335
    PROCHOT_ACCUMULATED: 0
    PPT_ACCUMULATED: 586332
    SOCKET_THERMAL_ACCUMULATED: 18010
    VR_THERMAL_ACCUMULATED: 0
    HBM_THERMAL_ACCUMULATED: 0
    PROCHOT_VIOLATION_STATUS: NOT ACTIVE
    PPT_VIOLATION_STATUS: NOT ACTIVE
    SOCKET_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    VR_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    HBM_THERMAL_VIOLATION_STATUS: NOT ACTIVE
    PROCHOT_VIOLATION_ACTIVITY: 0 %
    PPT_VIOLATION_ACTIVITY: 0 %
    SOCKET_THERMAL_VIOLATION_ACTIVITY: 0 %
    VR_THERMAL_VIOLATION_ACTIVITY: 0 %
```

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```

XCP_0: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_1: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_2: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_3: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_4: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_5: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_6: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
XCP_7: [0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, 0 %, N/A, N/A, N/A, N/A, N/A, N/A,
N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/
↔A,
    N/A, N/A, N/A]
VCN_BUSY:
XCP_0: [0 %, N/A, N/A, N/A]
XCP_1: [0 %, N/A, N/A, N/A]
XCP_2: [0 %, N/A, N/A, N/A]
XCP_3: [0 %, N/A, N/A, N/A]
XCP_4: [0 %, N/A, N/A, N/A]
XCP_5: [0 %, N/A, N/A, N/A]
XCP_6: [0 %, N/A, N/A, N/A]
XCP_7: [0 %, N/A, N/A, N/A]
GFX_BUSY_ACC:
XCP_0: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_1: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_2: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_3: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_4: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_5: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_6: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_7: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]

```

GPU: 1

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```

XCP_0: [0 %, N/A, N/A, N/A]
XCP_1: [0 %, N/A, N/A, N/A]
XCP_2: [0 %, N/A, N/A, N/A]
XCP_3: [0 %, N/A, N/A, N/A]
XCP_4: [0 %, N/A, N/A, N/A]
XCP_5: [0 %, N/A, N/A, N/A]
XCP_6: [0 %, N/A, N/A, N/A]
XCP_7: [0 %, N/A, N/A, N/A]
GFX_BUSY_ACC:
XCP_0: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_1: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_2: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_3: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_4: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_5: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_6: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]
XCP_7: [N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A]

```

...

- Added `LC_PERF_OTHER_END_RECOVERY` CLI output to `amd-smi metric --pcie` and updated `amdsmi_get_pcie_info()` to include this value.

Feature is only available on MI300+ ASICs

Users can now retrieve both through `amdsmi_get_pcie_info()` which has an updated structure:

```

typedef struct {
    ...
    struct pcie_metric {
        uint16_t pcie_width;           //!< current PCIe width
        uint32_t pcie_speed;           //!< current PCIe speed in MT/s
        uint32_t pcie_bandwidth;      //!< current instantaneous PCIe bandwidth in
        ↪ Mb/s
        uint64_t pcie_replay_count;    //!< total number of the replays issued on the
        ↪ PCIe link
        uint64_t pcie_l0_to_recovery_count; //!< total number of times the PCIe link
        ↪ transitioned from L0 to the recovery state
        uint64_t pcie_replay_roll_over_count; //!< total number of replay rollovers issued
        ↪ on the PCIe link
        uint64_t pcie_nak_sent_count;  //!< total number of NAKs issued on the PCIe
        ↪ link by the device
        uint64_t pcie_nak_received_count; //!< total number of NAKs issued on the PCIe
        ↪ link by the receiver
        uint32_t pcie_lc_perf_other_end_recovery_count; //!< PCIe other end recovery counter
        uint64_t reserved[12];
    } pcie_metric;
    uint64_t reserved[32];
} amdsmi_pcie_info_t;

```

- Example outputs are listed below (below is for reference, output is subject to change):

```

$ amd-smi metric --pcie
GPU: 0

```

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```

PCIE:
  WIDTH: 16
  SPEED: 32 GT/s
  BANDWIDTH: 18 Mb/s
  REPLAY_COUNT: 0
  L0_TO_RECOVERY_COUNT: 0
  REPLAY_ROLL_OVER_COUNT: 0
  NAK_SENT_COUNT: 0
  NAK_RECEIVED_COUNT: 0
  CURRENT_BANDWIDTH_SENT: N/A
  CURRENT_BANDWIDTH_RECEIVED: N/A
  MAX_PACKET_SIZE: N/A
  LC_PERF_OTHER_END_RECOVERY: 0

GPU: 1
  PCIE:
    WIDTH: 16
    SPEED: 32 GT/s
    BANDWIDTH: 18 Mb/s
    REPLAY_COUNT: 0
    L0_TO_RECOVERY_COUNT: 0
    REPLAY_ROLL_OVER_COUNT: 0
    NAK_SENT_COUNT: 0
    NAK_RECEIVED_COUNT: 0
    CURRENT_BANDWIDTH_SENT: N/A
    CURRENT_BANDWIDTH_RECEIVED: N/A
    MAX_PACKET_SIZE: N/A
    LC_PERF_OTHER_END_RECOVERY: 0
...

```

- **Added retrieving a set of GPUs that are nearest to a given device at a specific link type level.**
 - Added `amdsmi_get_link_topology_nearest()` function to amd-smi C and Python Libraries.
- **Added more supported utilization count types to `amdsmi_get_utilization_count()`.**
- **Added `amd-smi set -L/--clk-limit ...` command.**

Equivalent to rocm-smi's `--extremum` command which sets `selk`'s or `melk`'s soft minimum or soft maximum clock frequency.
- **Added unittest functionality to test `amdsmi` API calls in Python.**
- **Changed the power parameter in `amdsmi_get_energy_count()` to `energy_accumulator`.**
 - Changes propagate forwards into the python interface as well, however we are maintaining backwards compatibility and keeping the power field in the python API until ROCm 6.4.
- **Added GPU memory overdrive percentage to `amd-smi metric -o`.**
 - Added `amdsmi_get_gpu_mem_overdrive_level()` function to amd-smi C and Python Libraries.
- **Added retrieving connection type and P2P capabilities between two GPUs.**
 - Added `amdsmi_topo_get_p2p_status()` function to amd-smi C and Python Libraries.
 - Added retrieving P2P link capabilities to CLI `amd-smi topology`.

```
$ amd-smi topology -h
usage: amd-smi topology [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                        [-g GPU [GPU ...]] [-a] [-w] [-o] [-t] [-b]

If no GPU is specified, returns information for all GPUs on the system.
If no topology argument is provided all topology information will be displayed.

Topology arguments:
  -h, --help                show this help message and exit
  -g, --gpu GPU [GPU ...]  Select a GPU ID, BDF, or UUID from the possible choices:
                           ID: 0 | BDF: 0000:0c:00.0 | UUID: <redacted>
                           ID: 1 | BDF: 0000:22:00.0 | UUID: <redacted>
                           ID: 2 | BDF: 0000:38:00.0 | UUID: <redacted>
                           ID: 3 | BDF: 0000:5c:00.0 | UUID: <redacted>
                           ID: 4 | BDF: 0000:9f:00.0 | UUID: <redacted>
                           ID: 5 | BDF: 0000:af:00.0 | UUID: <redacted>
                           ID: 6 | BDF: 0000:bf:00.0 | UUID: <redacted>
                           ID: 7 | BDF: 0000:df:00.0 | UUID: <redacted>
                           all | Selects all devices

  -a, --access              Displays link accessibility between GPUs
  -w, --weight              Displays relative weight between GPUs
  -o, --hops                Displays the number of hops between GPUs
  -t, --link-type           Displays the link type between GPUs
  -b, --numa-bw             Display max and min bandwidth between nodes
  -c, --coherent            Display cache coherent (or non-coherent) link capability
↪ between nodes
  -n, --atomics             Display 32 and 64-bit atomic io link capability between nodes
  -d, --dma                 Display P2P direct memory access (DMA) link capability
↪ between nodes
  -z, --bi-dir              Display P2P bi-directional link capability between nodes

Command Modifiers:
  --json                    Displays output in JSON format (human readable by default).
  --csv                     Displays output in CSV format (human readable by default).
  --file FILE               Saves output into a file on the provided path (stdout by
↪ default).
  --loglevel LEVEL          Set the logging level from the possible choices:
                           DEBUG, INFO, WARNING, ERROR, CRITICAL
```

```
$ amd-smi topology -cndz
CACHE COHERANCY TABLE:
      0000:0c:00.0 0000:22:00.0 0000:38:00.0 0000:5c:00.0 0000:9f:00.0 0000:af:00.
↪ 0 0000:bf:00.0 0000:df:00.0
0000:0c:00.0 SELF          C          NC          NC          C          C          ↪
↪ C          NC
0000:22:00.0 C          SELF          NC          C          C          C          ↪
↪ NC          C
0000:38:00.0 NC          NC          SELF          C          C          NC          ↪
↪ C          NC
0000:5c:00.0 NC          C          C          SELF          NC          C          ↪
↪ NC          NC
```

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0000:9f:00.0	C	C	C	NC	SELF	NC	↵
↵ NC	C						
0000:af:00.0	C	C	NC	C	NC	SELF	↵
↵ C	C						
0000:bf:00.0	C	NC	C	NC	NC	C	↵
↵ SELF	NC						
0000:df:00.0	NC	C	NC	NC	C	C	↵
↵ NC	SELF						

ATOMICS TABLE:

	0000:0c:00.0	0000:22:00.0	0000:38:00.0	0000:5c:00.0	0000:9f:00.0	0000:af:00.0	
↵ 0	0000:bf:00.0	0000:df:00.0					
0000:0c:00.0	SELF	64,32	64,32	64	32	32	↵
↵ N/A	64,32						
0000:22:00.0	64,32	SELF	64	32	32	N/A	↵
↵ 64,32	64,32						
0000:38:00.0	64,32	64	SELF	32	N/A	64,32	↵
↵ 64,32	64,32						
0000:5c:00.0	64	32	32	SELF	64,32	64,32	↵
↵ 64,32	32						
0000:9f:00.0	32	32	N/A	64,32	SELF	64,32	↵
↵ 32	32						
0000:af:00.0	32	N/A	64,32	64,32	64,32	SELF	↵
↵ 32	N/A						
0000:bf:00.0	N/A	64,32	64,32	64,32	32	32	↵
↵ SELF	64,32						
0000:df:00.0	64,32	64,32	64,32	32	32	N/A	↵
↵ 64,32	SELF						

DMA TABLE:

	0000:0c:00.0	0000:22:00.0	0000:38:00.0	0000:5c:00.0	0000:9f:00.0	0000:af:00.0	
↵ 0	0000:bf:00.0	0000:df:00.0					
0000:0c:00.0	SELF	T	T	F	F	T	↵
↵ F	T						
0000:22:00.0	T	SELF	F	F	T	F	↵
↵ T	T						
0000:38:00.0	T	F	SELF	T	F	T	↵
↵ T	T						
0000:5c:00.0	F	F	T	SELF	T	T	↵
↵ T	F						
0000:9f:00.0	F	T	F	T	SELF	T	↵
↵ F	F						
0000:af:00.0	T	F	T	T	T	SELF	↵
↵ F	T						
0000:bf:00.0	F	T	T	T	F	F	↵
↵ SELF	F						
0000:df:00.0	T	T	T	F	F	T	↵
↵ F	SELF						

BI-DIRECTIONAL TABLE:

	0000:0c:00.0	0000:22:00.0	0000:38:00.0	0000:5c:00.0	0000:9f:00.0	0000:af:00.0	
↵ 0	0000:bf:00.0	0000:df:00.0					

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0000:0c:00.0	SELF	T	T	F	F	T	└─
→ F	T						
0000:22:00.0	T	SELF	F	F	T	F	└─
→ T	T						
0000:38:00.0	T	F	SELF	T	F	T	└─
→ T	T						
0000:5c:00.0	F	F	T	SELF	T	T	└─
→ T	F						
0000:9f:00.0	F	T	F	T	SELF	T	└─
→ F	F						
0000:af:00.0	T	F	T	T	T	SELF	└─
→ F	T						
0000:bf:00.0	F	T	T	T	F	F	└─
→ SELF	F						
0000:df:00.0	T	T	T	F	F	T	└─
→ F	SELF						

Legend:

SELF = Current GPU
ENABLED / DISABLED = Link is enabled or disabled
N/A = Not supported
T/F = True / False
C/NC = Coherent / Non-Coherent io links
64,32 = 64 bit and 32 bit atomic support
<BW from>-<BW to>

- Created new `amdsmi_kfd_info_t` and added information under `amd-smi list`.

- Due to fixes needed to properly enumerate all logical GPUs in CPX, new device identifiers were added in to a new `amdsmi_kfd_info_t` which gets populated via the API `amdsmi_get_gpu_kfd_info()`.
- This info has been added to the `amd-smi list`.
- These new fields are only available for BM/Guest Linux devices at this time.

```

typedef struct {
    uint64_t kfd_id;    ///< 0xFFFFFFFFFFFFFFFF if not supported
    uint32_t node_id;  ///< 0xFFFFFFFF if not supported
    uint32_t current_partition_id; ///< 0xFFFFFFFF if not supported
    uint32_t reserved[12];
} amdsmi_kfd_info_t;

```

```

$ amd-smi list
GPU: 0
  BDF: 0000:23:00.0
  UUID: <redacted>
  KFD_ID: 45412
  NODE_ID: 1
  PARTITION_ID: 0

GPU: 1
  BDF: 0000:26:00.0
  UUID: <redacted>

```

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```
KFD_ID: 59881
NODE_ID: 2
PARTITION_ID: 0
```

- Added Subsystem Device ID to `amd-smi static --asic`.

- No underlying changes to `amdsmi_get_gpu_asic_info`

```
$ amd-smi static --asic
GPU: 0
ASIC:
  MARKET_NAME: MI308X
  VENDOR_ID: 0x1002
  VENDOR_NAME: Advanced Micro Devices Inc. [AMD/ATI]
  SUBVENDOR_ID: 0x1002
  DEVICE_ID: 0x74a2
  SUBSYSTEM_ID: 0x74a2
  REV_ID: 0x00
  ASIC_SERIAL: <redacted>
  OAM_ID: 5
  NUM_COMPUTE_UNITS: 20
  TARGET_GRAPHICS_VERSION: gfx942
```

- Added `Target_Graphics_Version` to `amd-smi static --asic` and `amdsmi_get_gpu_asic_info()`.

```
typedef struct {
  char market_name[AMDSMI_256_LENGTH];
  uint32_t vendor_id;    ///< Use 32 bit to be compatible with other platform.
  char vendor_name[AMDSMI_MAX_STRING_LENGTH];
  uint32_t subvendor_id; ///< The subsystem vendor id
  uint64_t device_id;   ///< The device id of a GPU
  uint32_t rev_id;
  char asic_serial[AMDSMI_NORMAL_STRING_LENGTH];
  uint32_t oam_id;      ///< 0xFFFF if not supported
  uint32_t num_of_compute_units; ///< 0xFFFFFFFF if not supported
  uint64_t target_graphics_version; ///< 0xFFFFFFFFFFFFFFFF if not supported
  uint32_t reserved[15];
} amdsmi_asic_info_t;
```

```
$ amd-smi static --asic
GPU: 0
ASIC:
  MARKET_NAME: MI308X
  VENDOR_ID: 0x1002
  VENDOR_NAME: Advanced Micro Devices Inc. [AMD/ATI]
  SUBVENDOR_ID: 0x1002
  DEVICE_ID: 0x74a2
  SUBSYSTEM_ID: 0x74a2
  REV_ID: 0x00
  ASIC_SERIAL: <redacted>
  OAM_ID: 5
  NUM_COMPUTE_UNITS: 20
  TARGET_GRAPHICS_VERSION: gfx942
```

11.7.2 Changed

- Improvement: Users now have the ability to set and reset without providing `-g all` using AMD SMI CLI.**
 Users can now provide set and reset without `-g all`. Previously, users were required to provide:
`sudo amd-smi set -g all <set arguments>` or `sudo amd-smi reset -g all <set arguments>`
 This update allows users to set or reset without providing `-g all` arguments. Allowing commands:
`sudo amd-smi set <set arguments>` or `sudo amd-smi reset <set arguments>`
 This action will default to try to set/reset for all AMD GPUs on the user's system.
- Improvement: `amd-smi set --memory-partition` now includes a warning banner and progress bar.**
 For devices which support dynamically changing memory partitions, we now provide a warning for users. We provide this warning to provide users knowledge that this action requires users to quit any gpu workloads. Also to let them know this process will trigger an AMD GPU driver reload. Since this process takes time to complete, a progress bar has been provided until actions can verified as a successful change. Otherwise, AMD SMI will report any errors to users and what actions can be taken. See example below:

```
$ sudo amd-smi set -M NPS1

***** WARNING *****

Setting Dynamic Memory (NPS) partition modes require users to quit all GPU
workloads.
AMD SMI will then attempt to change memory (NPS) partition mode.
Upon a successful set, AMD SMI will then initiate an action to restart amdgpu
driver.
This action will change all GPU's in the hive to the requested memory (NPS)
partition mode.

Please use this utility with caution.

Do you accept these terms? [Y/N] y

Updating memory partition for gpu 0: [] 40/40 secs remain

GPU: 0
MEMORYPARTITION: Successfully set memory partition to NPS1

GPU: 1
MEMORYPARTITION: Successfully set memory partition to NPS1

GPU: 2
MEMORYPARTITION: Successfully set memory partition to NPS1
...
```

- Updated `amdsmi_get_gpu_accelerator_partition_profile` to provide driver memory partition capabilities.**
 Driver now has the ability to report what the user can set memory partition modes to. User can now see available memory partition modes upon an invalid argument return from memory partition mode set (`amdsmi_set_gpu_memory_partition`). This change also updates `amd-smi partition`, `amd-smi partition --memory`, and `amd-smi partition --accelerator` (*see note below)
**Note: Subject to change for ROCm 6.4*
- Updated `amdsmi_set_gpu_memory_partition` to not return until a successful restart of AMD GPU Driver.**
 This change keeps checking for ~ up to 40 seconds for a successful restart of the AMD GPU driver. Additionally, the API call continues to check if memory partition (NPS) SYSFS files are successfully updated to reflect the

user's requested memory partition (NPS) mode change. Otherwise, reports an error back to the user. Due to these changes, we have updated AMD SMI's CLI to reflect the maximum wait of 40 seconds, while a memory partition change is in progress.

- **All APIs now have the ability to catch driver reporting invalid arguments.**

Now AMD SMI APIs can show `AMDSMI_STATUS_INVALID` when driver returns `EINVAL`.

For example, if user tries to set to `NPS8`, but the memory partition mode is not an available mode to set to. Commonly referred to as `CAPS` (see `amd-smi partition --memory`), provided by `amdsmi_get_gpu_accelerator_partition_profile`(*see note below).

**Note: Subject to change for ROCm 6.4*

- **Updated BDF commands to look use KFD SYSFS for BDF: `amdsmi_get_gpu_device_bdf()`.**

This aligns BDF output with ROCm SMI. See below for overview as seen from `rsmi_dev_pci_id_get()` now provides partition ID. See API for better detail. Previously these bits were reserved bits (right before domain) and partition id was within function.

- bits [63:32] = domain
- bits [31:28] = partition id
- bits [27:16] = reserved
- bits [15: 0] = pci bus/device/function

- **Moved python tests directory path install location.**

- `/opt/<rocm-path>/share/amd_smi/pytest/..` to `/opt/<rocm-path>/share/amd_smi/tests/python_unittest/..`
- On `amd-smi-lib-tests` uninstall, the `amd_smi` tests folder is removed
- Removed `pytest` dependency, our python testing now only depends on the `unittest` framework.

- **Updated Partition APIs and struct information and added `partition_id` to `amd-smi static --partition`.**

- As part of an overhaul to partition information, some partition information will be made available in the `amdsmi_accelerator_partition_profile_t`.
- This struct will be filled out by a new API, `amdsmi_get_gpu_accelerator_partition_profile()`.
- Future data from these APIs will eventually get added to `amd-smi partition`.

```
#define AMDSMI_MAX_ACCELERATOR_PROFILE    32
#define AMDSMI_MAX_CP_PROFILE_RESOURCES  32
#define AMDSMI_MAX_ACCELERATOR_PARTITIONS 8

/**
 * @brief Accelerator Partition. This enum is used to identify
 * various accelerator partitioning settings.
 */
typedef enum {
    AMDSMI_ACCELERATOR_PARTITION_INVALID = 0,
    AMDSMI_ACCELERATOR_PARTITION_SPX,    //!< Single GPU mode (SPX)- All XCCs work
                                        //!< together with shared memory
    AMDSMI_ACCELERATOR_PARTITION_DPX,    //!< Dual GPU mode (DPX)- Half XCCs work
                                        //!< together with shared memory
    AMDSMI_ACCELERATOR_PARTITION_TPX,    //!< Triple GPU mode (TPX)- One-third XCCs
                                        //!< work together with shared memory
    AMDSMI_ACCELERATOR_PARTITION_QPX,    //!< Quad GPU mode (QPX)- Quarter XCCs
```

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```

AMDAMI_ACCELERATOR_PARTITION_CPX,      ///< work together with shared memory
                                        ///< Core mode (CPX)- Per-chip XCC with
                                        ///< shared memory
} amdsmi_accelerator_partition_type_t;

/**
 * @brief Possible Memory Partition Modes.
 * This union is used to identify various memory partitioning settings.
 */
typedef union {
    struct {
        uint32_t nps1_cap :1;  // bool 1 = true; 0 = false; Max uint32 means unsupported
        uint32_t nps2_cap :1;  // bool 1 = true; 0 = false; Max uint32 means unsupported
        uint32_t nps4_cap :1;  // bool 1 = true; 0 = false; Max uint32 means unsupported
        uint32_t nps8_cap :1;  // bool 1 = true; 0 = false; Max uint32 means unsupported
        uint32_t reserved :28;
    } amdsmi_nps_flags_t;

    uint32_t nps_cap_mask;
} amdsmi_nps_caps_t;

typedef struct {
    amdsmi_accelerator_partition_type_t profile_type;  // SPX, DPX, QPX, CPX and so on
    uint32_t num_partitions;  // On MI300X, SPX: 1, DPX: 2, QPX: 4, CPX: 8, length of
    ↪resources array
    uint32_t profile_index;
    amdsmi_nps_caps_t memory_caps;  // Possible memory partition capabilities
    uint32_t num_resources;  // length of index_of_resources_profile
    uint32_t resources[AMDAMI_MAX_ACCELERATOR_PARTITIONS][AMDAMI_MAX_CP_PROFILE_RESOURCES];
    uint64_t reserved[6];
} amdsmi_accelerator_partition_profile_t;

```

```

$ amd-smi static --partition
GPU: 0
PARTITION:
    COMPUTE_PARTITION: CPX
    MEMORY_PARTITION: NPS4
    PARTITION_ID: 0

```

11.7.3 Removed

- Removed `amd-smi reset --compute-partition` and `... --memory-partition` and associated APIs.
 - This change is part of the partition redesign. Reset functionality will be reintroduced in a later update.
 - associated APIs include `amdsmi_reset_gpu_compute_partition()` and `amdsmi_reset_gpu_memory_partition()`
- Removed usage of `_validate_positive` in Parser and replaced with `_positive_int` and `_not_negative_int` as appropriate.
 - This will allow 0 to be a valid input for several options in setting CPUs where appropriate (for example, as a mode or NBIOD)

11.7.4 Optimized

- Adjusted ordering of `gpu_metrics` calls to ensure that `pcie_bw` values remain stable in `amd-smi metric` & `amd-smi monitor`.
 - With this change additional padding was added to `PCIE_BW` `amd-smi monitor --pcie`

11.7.5 Resolved issues

- Fixed `amdsmi_get_gpu_asic_info`'s `target_graphics_version` and `amd-smi --asic` not displaying properly for MI2x or Navi 3x ASICs.
- Fixed `amd-smi reset` commands showing an `AttributeError`.
- Improved Offline install process & lowered dependency for PyYAML.
- Fixed CPX not showing total number of logical GPUs.
 - Updates were made to `amdsmi_init()` and `amdsmi_get_gpu_bdf_id(..)`. In order to display all logical devices, we needed a way to provide order to GPU's enumerated. This was done by adding a `partition_id` within the BDF optional `pci_id` bits.
 - * bits [63:32] = domain
 - * bits [31:28] or bits [2:0] = partition id
 - * bits [27:16] = reserved
 - * bits [15:8] = Bus
 - * bits [7:3] = Device
 - * bits [2:0] = Function (partition id maybe in bits [2:0]) <-- Fallback for non SPX modes
 - Previously in non-SPX modes (ex. CPX/TPX/DPX/etc) some MI3x ASICs would not report all logical GPU devices within AMD SMI.

```
$ amd-smi monitor -p -t -v
GPU  POWER  GPU_TEMP  MEM_TEMP  VRAM_USED  VRAM_TOTAL
0    248 W   55 °C    48 °C    283 MB    196300 MB
1    247 W   55 °C    48 °C    283 MB    196300 MB
2    247 W   55 °C    48 °C    283 MB    196300 MB
3    247 W   55 °C    48 °C    283 MB    196300 MB
4    221 W   50 °C    42 °C    283 MB    196300 MB
5    221 W   50 °C    42 °C    283 MB    196300 MB
6    222 W   50 °C    42 °C    283 MB    196300 MB
7    221 W   50 °C    42 °C    283 MB    196300 MB
8    239 W   53 °C    46 °C    283 MB    196300 MB
9    239 W   53 °C    46 °C    283 MB    196300 MB
10   239 W   53 °C    46 °C    283 MB    196300 MB
11   239 W   53 °C    46 °C    283 MB    196300 MB
12   219 W   51 °C    48 °C    283 MB    196300 MB
13   219 W   51 °C    48 °C    283 MB    196300 MB
14   219 W   51 °C    48 °C    283 MB    196300 MB
15   219 W   51 °C    48 °C    283 MB    196300 MB
```

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16	222	W	51 °C	47 °C	283 MB	196300 MB
17	222	W	51 °C	47 °C	283 MB	196300 MB
18	222	W	51 °C	47 °C	283 MB	196300 MB
19	222	W	51 °C	48 °C	283 MB	196300 MB
20	241	W	55 °C	48 °C	283 MB	196300 MB
21	241	W	55 °C	48 °C	283 MB	196300 MB
22	241	W	55 °C	48 °C	283 MB	196300 MB
23	240	W	55 °C	48 °C	283 MB	196300 MB
24	211	W	51 °C	45 °C	283 MB	196300 MB
25	211	W	51 °C	45 °C	283 MB	196300 MB
26	211	W	51 °C	45 °C	283 MB	196300 MB
27	211	W	51 °C	45 °C	283 MB	196300 MB
28	227	W	51 °C	49 °C	283 MB	196300 MB
29	227	W	51 °C	49 °C	283 MB	196300 MB
30	227	W	51 °C	49 °C	283 MB	196300 MB
31	227	W	51 °C	49 °C	283 MB	196300 MB

- Fixed incorrect implementation of the Python API `amdsmi_get_gpu_metrics_header_info()`.
- `amdsmi tst TestGpuMetricsRead` now prints metric in correct units.

11.7.6 Upcoming changes

- Python API for `amdsmi_get_energy_count()` will deprecate the `power` field in ROCm 6.4 and use `energy_accumulator` field instead.
- New memory and compute partition APIs incoming for ROCm 6.4.
 - These APIs will be updated to fully populate the CLI and allowing compute (accelerator) partitions to be set by profile ID.
 - One API will be provided, to reset both memory and compute (accelerator).
 - * There are dependencies regarding available compute partitions when in other memory modes.
 - * Driver will be providing these default modes
 - * Memory partition resets (for BM) require driver reloads - this will allow us to notify users before taking this action, then change to the default compute partition modes.
 - The following APIs will remain:

```
amdsmi_status_t
amdsmi_set_gpu_compute_partition(amdsmi_processor_handle processor_handle,
                                amdsmi_compute_partition_type_t compute_partition);
amdsmi_status_t
amdsmi_get_gpu_compute_partition(amdsmi_processor_handle processor_handle,
                                char *compute_partition, uint32_t len);
amdsmi_status_t
amdsmi_get_gpu_memory_partition(amdsmi_processor_handle processor_handle,
                                char *memory_partition, uint32_t len);
amdsmi_status_t
amdsmi_set_gpu_memory_partition(amdsmi_processor_handle processor_handle,
                                amdsmi_memory_partition_type_t memory_partition);
```

- **amd-smi set --compute-partition “SPX/DPX/CPX...” will modified to accept profile IDs in ROCm 6.4.**
 - This is due to aligning with Host setups and providing more robust partition information through the APIs outlined above. Furthermore, new APIs which will be available on both BM/Host can set by profile ID. (functionality coming soon!)
- **Added preliminary amd-smi partition command.**
 - The new partition command can be used to display GPU information, including memory and accelerator partition information.
 - The command will be at full functionality once additional partition information from `amdsmi_get_gpu_accelerator_partition_profile()` has been implemented.

11.8 amd_smi_lib for ROCm 6.2.1

11.8.1 Added

- **Removed amd-smi metric --ecc & amd-smi metric --ecc-blocks on Guest VMs.** Guest VMs do not support getting current ECC counts from the Host cards.
- **Added amd-smi static --rason Guest VMs.** Guest VMs can view enabled/disabled ras features that are on Host cards.

11.8.2 Resolved issues

- **Fixed TypeError in amd-smi process -G.**
- **Updated CLI error strings to handle empty and invalid GPU/CPU inputs.**
- **Fixed Guest VM showing passthrough options.**
- **Fixed firmware formatting where leading 0s were missing.**

11.9 amd_smi_lib for ROCm 6.2.0

11.9.1 Added

- **amd-smi dmon is now available as an alias to amd-smi monitor.**
- **Added optional process table under amd-smi monitor -q.**
The monitor subcommand within the CLI Tool now has the `-q` option to enable an optional process table underneath the original monitored output.

```
$ amd-smi monitor -q
GPU POWER GPU_TEMP MEM_TEMP GFX_UTIL GFX_CLOCK MEM_UTIL MEM_CLOCK ENC_UTIL ENC_
→CLOCK DEC_UTIL DEC_CLOCK SINGLE_ECC DOUBLE_ECC PCIE_REPLAY VRAM_USED VRAM_TOTAL_
→ PCIE_BW
0 199 W 103 °C 84 °C 99 % 1920 MHz 31 % 1000 MHz N/A
→0 MHz N/A 0 MHz 0 0 0 1235 MB 16335 MB_
→ N/A Mb/s

PROCESS INFO:
GPU NAME PID GTT_MEM CPU_MEM VRAM_MEM MEM_USAGE GFX ENC
0 rvs 1564865 0.0 B 0.0 B 1.1 GB 0.0 B 0 ns 0 ns
```

- **Added Handling to detect VMs with passthrough configurations in CLI Tool.**

CLI Tool had only allowed a restricted set of options for Virtual Machines with passthrough GPUs. Now we offer an expanded set of functions available to passthrough configured GPUs.

- **Added Process Isolation and Clear SRAM functionality to the CLI Tool for VMs.**

VMs now have the ability to set the process isolation and clear the sram from the CLI tool. Using the following commands

```
amd-smi set --process-isolation <0 or 1>
amd-smi reset --clean_local_data
```

- **Added macros that were in `amdsmi.h` to the `amdsmi` Python library `amdsmi_interface.py`.**

Added macros to reference max size limitations for certain `amdsmi` functions such as max dpm policies and max fanspeed.

- **Added Ring Hang event.**

Added `AMDSMI_EVT_NOTIF_RING_HANG` to the possible events in the `amdsmi_evt_notification_type_t` enum.

11.9.2 Optimized

- **Updated CLI error strings to specify invalid device type queried**

```
$ amd-smi static --asic --gpu 123123
Can not find a device: GPU '123123' Error code: -3
```

- **Removed elevated permission requirements for `amdsmi_get_gpu_process_list()`.**

Previously if a processes with elevated permissions was running `amd-smi` would required `sudo` to display all output. Now `amd-smi` will populate all process data and return N/A for elevated process names instead. However if ran with `sudo` you will be able to see the name like so:

```
$ amd-smi process
GPU: 0
PROCESS_INFO:
  NAME: N/A
  PID: 1693982
  MEMORY_USAGE:
    GTT_MEM: 0.0 B
    CPU_MEM: 0.0 B
    VRAM_MEM: 10.1 GB
  MEM_USAGE: 0.0 B
  USAGE:
    GFX: 0 ns
    ENC: 0 ns
```

```
$ sudo amd-smi process
GPU: 0
PROCESS_INFO:
  NAME: TransferBench
  PID: 1693982
  MEMORY_USAGE:
    GTT_MEM: 0.0 B
    CPU_MEM: 0.0 B
    VRAM_MEM: 10.1 GB
  MEM_USAGE: 0.0 B
```

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USAGE:

GFX: 0 ns
ENC: 0 ns

- **Updated naming for `amdsmi_set_gpu_clear_sram_data()` to `amdsmi_clean_gpu_local_data()`.**
Changed the naming to be more accurate to what the function was doing. This change also extends to the CLI where we changed the `clear-sram-data` command to `clean_local_data`.
- **Updated `amdsmi_clk_info_t` struct in `amdsmi.h` and `amdsmi_interface.py` to align with host/guest.**
Changed `cur_clk` to `clk`, changed `sleep_clk` to `clk_deep_sleep`, and added `clk_locked` value. New struct will be in the following format:

```
typedef struct {
+ uint32_t clk;
  uint32_t min_clk;
  uint32_t max_clk;
+ uint8_t clk_locked;
+ uint8_t clk_deep_sleep;
  uint32_t reserved[4];
} amdsmi_clk_info_t;
```

- **Multiple structure updates in `amdsmi.h` and `amdsmi_interface.py` to align with host/guest.**
Multiple structures used by APIs were changed for alignment unification:
 - Changed `amdsmi_vram_info_t` `vram_size_mb` field changed to `vram_size`
 - Updated `amdsmi_vram_type_t` struct updated to include new enums and added AMDSMI prefix
 - Updated `amdsmi_status_t` some enums were missing the AMDSMI_STATUS prefix
 - Added AMDSMI_PROCESSOR_TYPE prefix to `processor_type_t` enums
 - Removed the fields structure definition in favor for an anonymous definition in `amdsmi_bdf_t`
- **Added AMDSMI prefix in `amdsmi.h` and `amdsmi_interface.py` to align with host/guest.**
Multiple structures used by APIs were changed for alignment unification. AMDSMI prefix was added to the following structures:
 - Added AMDSMI prefix to `amdsmi_container_types_t` enums
 - Added AMDSMI prefix to `amdsmi_clk_type_t` enums
 - Added AMDSMI prefix to `amdsmi_compute_partition_type_t` enums
 - Added AMDSMI prefix to `amdsmi_memory_partition_type_t` enums
 - Added AMDSMI prefix to `amdsmi_clk_type_t` enums
 - Added AMDSMI prefix to `amdsmi_temperature_type_t` enums
 - Added AMDSMI prefix to `amdsmi_fw_block_t` enums
- **Changed `dpm_policy` references to `soc_pstate`.**
The file structure referenced to `dpm_policy` changed to `soc_pstate` and we have changed the APIs and CLI tool to be inline with the current structure. `amdsmi_get_dpm_policy()` and `amdsmi_set_dpm_policy()` is no longer valid with the new API being `amdsmi_get_soc_pstate()` and `amdsmi_set_soc_pstate()`. The CLI tool has been changed from `--policy` to `--soc-pstate`
- **Updated `amdsmi_get_gpu_board_info()` `product_name` to fallback to `pciids`.**
Previously on devices without a FRU we would not populate the product name in the `amdsmi_board_info_t` structure, now we will fallback to using the name listed according to the `pciids` file if available.

- **Updated CLI voltage curve command output.**

The output for `amd-smi metric --voltage-curve` now splits the frequency and voltage output by curve point or outputs N/A for each curve point if not applicable

```
GPU: 0
VOLTAGE_CURVE:
  POINT_0_FREQUENCY: 872 Mhz
  POINT_0_VOLTAGE: 736 mV
  POINT_1_FREQUENCY: 1354 Mhz
  POINT_1_VOLTAGE: 860 mV
  POINT_2_FREQUENCY: 1837 Mhz
  POINT_2_VOLTAGE: 1186 mV
```

- **Updated `amdsmi_get_gpu_board_info()` now has larger structure sizes for `amdsmi_board_info_t`.**

Updated sizes that work for retrieving relevant board information across AMD's ASIC products. This requires users to update any ABIs using this structure.

11.9.3 Resolved issues

- **Fixed Leftover Mutex deadlock when running multiple instances of the CLI tool.**

When running `amd-smi reset --gpureset --gpu all` and then running an instance of `amd-smi static` (or any other subcommand that access the GPUs) a mutex would lock and not return requiring either a clear of the mutex in `/dev/shm` or rebooting the machine.

- **Fixed multiple processes not being registered in `amd-smi process` with json and csv format.**

Multiple process outputs in the CLI tool were not being registered correctly. The json output did not handle multiple processes and is now in a new valid json format:

```
[
  {
    "gpu": 0,
    "process_list": [
      {
        "process_info": {
          "name": "TransferBench",
          "pid": 420157,
          "mem_usage": {
            "value": 0,
            "unit": "B"
          }
        }
      },
      {
        "process_info": {
          "name": "rvs",
          "pid": 420315,
          "mem_usage": {
            "value": 0,
            "unit": "B"
          }
        }
      }
    ]
  }
]
```

- **Removed throttle-status from amd-smi monitor as it is no longer reliably supported.**
Throttle status may work for older ASICs, but will be replaced with PVIOL and TVIOL metrics for future ASIC support. It remains a field in the gpu_metrics API and in amd-smi metric --power.
- **amdsmi_get_gpu_board_info() no longer returns junk char strings.**
Previously if there was a partial failure to retrieve character strings, we would return garbage output to users using the API. This fix intends to populate as many values as possible. Then any failure(s) found along the way, \0 is provided to amdsmi_board_info_t structures data members which cannot be populated. Ensuring empty char string values.
- **Fixed parsing of pp_od_clk_voltage within amdsmi_get_gpu_od_volt_info.**
The parsing of pp_od_clk_voltage was not dynamic enough to work with the dropping of voltage curve support on MI series cards. This propagates down to correcting the CLI's output amd-smi metric --voltage-curve to N/A if voltage curve is not enabled.

11.9.4 Known issues

- **amdsmi_get_gpu_process_isolation and amdsmi_clean_gpu_local_data commands do not currently work and will be supported in a future release.**

11.10 amd_smi_lib for ROCm 6.1.2

11.10.1 Added

- **Added process isolation and clean shader APIs and CLI commands.**
Added APIs CLI and APIs to address LeftoverLocals security issues. Allowing clearing the sram data and setting process isolation on a per GPU basis. New APIs:
 - amdsmi_get_gpu_process_isolation()
 - amdsmi_set_gpu_process_isolation()
 - amdsmi_set_gpu_clear_sram_data()
- **Added MIN_POWER to output of amd-smi static --limit.**
This change helps users identify the range to which they can change the power cap of the GPU. The change is added to simplify why a device supports (or does not support) power capping (also known as overdrive). See `amd-smi set -g all --power-cap <value in W>` or `amd-smi reset -g all --power-cap`.

```
$ amd-smi static --limit
GPU: 0
LIMIT:
  MAX_POWER: 203 W
  MIN_POWER: 0 W
  SOCKET_POWER: 203 W
  SLOWDOWN_EDGE_TEMPERATURE: 100 °C
  SLOWDOWN_HOTSPOT_TEMPERATURE: 110 °C
  SLOWDOWN_VRAM_TEMPERATURE: 100 °C
  SHUTDOWN_EDGE_TEMPERATURE: 105 °C
  SHUTDOWN_HOTSPOT_TEMPERATURE: 115 °C
  SHUTDOWN_VRAM_TEMPERATURE: 105 °C

GPU: 1
LIMIT:
  MAX_POWER: 213 W
  MIN_POWER: 213 W
```

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```

SOCKET_POWER: 213 W
SLOWDOWN_EDGE_TEMPERATURE: 109 °C
SLOWDOWN_HOTSPOT_TEMPERATURE: 110 °C
SLOWDOWN_VRAM_TEMPERATURE: 100 °C
SHUTDOWN_EDGE_TEMPERATURE: 114 °C
SHUTDOWN_HOTSPOT_TEMPERATURE: 115 °C
SHUTDOWN_VRAM_TEMPERATURE: 105 °C

```

11.10.2 Optimized

- **Updated `amd-smi monitor --pcie` output.**

The source for pcie bandwidth monitor output was a legacy file we no longer support and was causing delays within the monitor command. The output is no longer using TX/RX but instantaneous bandwidth from `gpu_metrics` instead; updated output:

```

$ amd-smi monitor --pcie
GPU  PCIE_BW
0    26 Mb/s

```

- **`amdsmi_get_power_cap_info` now returns values in uW instead of W.**

`amdsmi_get_power_cap_info` will return in uW as originally reflected by driver. Previously `amdsmi_get_power_cap_info` returned W values, this conflicts with our sets and modifies values retrieved from driver. We decided to keep the values returned from driver untouched (in original units, uW). Then in CLI we will convert to watts (as previously done - no changes here). Additionally, driver made updates to min power cap displayed for devices when overdrive is disabled which prompted for this change (in this case `min_power_cap` and `max_power_cap` are the same).

- **Updated Python Library return types for `amdsmi_get_gpu_memory_reserved_pages` & `amdsmi_get_gpu_bad_page_info`.**

Previously calls were returning “No bad pages found.” if no pages were found, now it only returns the list type and can be empty.

- **Updated `amd-smi metric --ecc-blocks` output.**

The ecc blocks argument was outputting blocks without counters available, updated the filtering show blocks that counters are available for:

```

$ amd-smi metric --ecc-block
GPU: 0
ECC_BLOCKS:
  UMC:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
  SDMA:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
  GFX:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
  MMHUB:
    CORRECTABLE_COUNT: 0

```

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```

    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
PCIE_BIF:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
HDP:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
XGMI_WAFL:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0

```

- **Removed `amdsmi_get_gpu_process_info` from Python library.**

`amdsmi_get_gpu_process_info` was removed from the C library in an earlier build, but the API was still in the Python interface.

11.10.3 Resolved issues

- **Fixed `amd-smi metric --power` now provides power output for Navi2x/Navi3x/MI1x.**

These systems use an older version of `gpu_metrics` in `amdgpu`. This fix only updates what CLI outputs. No change in any of our APIs.

```

$ amd-smi metric --power
GPU: 0
POWER:
  SOCKET_POWER: 11 W
  GFX_VOLTAGE: 768 mV
  SOC_VOLTAGE: 925 mV
  MEM_VOLTAGE: 1250 mV
  POWER_MANAGEMENT: ENABLED
  THROTTLE_STATUS: UNTHROTTLED

GPU: 1
POWER:
  SOCKET_POWER: 17 W
  GFX_VOLTAGE: 781 mV
  SOC_VOLTAGE: 806 mV
  MEM_VOLTAGE: 1250 mV
  POWER_MANAGEMENT: ENABLED
  THROTTLE_STATUS: UNTHROTTLED

```

- **Fixed `amdsmitstReadWrite.TestPowerCapReadWrite` test for Navi3X, Navi2X, MI100.**

Updates required `amdsmi_get_power_cap_info` to return in uW as originally reflected by driver. Previously `amdsmi_get_power_cap_info` returned W values, this conflicts with our sets and modifies values retrieved from driver. We decided to keep the values returned from driver untouched (in original units, uW). Then in CLI we will convert to watts (as previously done - no changes here). Additionally, driver made updates to min power cap displayed for devices when overdrive is disabled which prompted for this change (in this case `min_power_cap` and `max_power_cap` are the same).

- **Fixed Python interface call `amdsmi_get_gpu_memory_reserved_pages` & `amdsmi_get_gpu_bad_page_info`.**

Previously Python interface calls to populated bad pages resulted in a `ValueError: NULL pointer access`. This fixes the bad-pages subcommand CLI subcommand as well.

11.11 `amd_smi_lib` for ROCm 6.1.1

11.11.1 Changed

- **Updated metrics –clocks.**

Output for `amd-smi metric --clock` is updated to reflect each engine and bug fixes for the clock lock status and deep sleep status.

```
$ amd-smi metric --clock
GPU: 0
CLOCK:
  GFX_0:
    CLK: 113 MHz
    MIN_CLK: 500 MHz
    MAX_CLK: 1800 MHz
    CLK_LOCKED: DISABLED
    DEEP_SLEEP: ENABLED
  GFX_1:
    CLK: 113 MHz
    MIN_CLK: 500 MHz
    MAX_CLK: 1800 MHz
    CLK_LOCKED: DISABLED
    DEEP_SLEEP: ENABLED
  GFX_2:
    CLK: 112 MHz
    MIN_CLK: 500 MHz
    MAX_CLK: 1800 MHz
    CLK_LOCKED: DISABLED
    DEEP_SLEEP: ENABLED
  GFX_3:
    CLK: 113 MHz
    MIN_CLK: 500 MHz
    MAX_CLK: 1800 MHz
    CLK_LOCKED: DISABLED
    DEEP_SLEEP: ENABLED
  GFX_4:
    CLK: 113 MHz
    MIN_CLK: 500 MHz
    MAX_CLK: 1800 MHz
    CLK_LOCKED: DISABLED
    DEEP_SLEEP: ENABLED
  GFX_5:
    CLK: 113 MHz
    MIN_CLK: 500 MHz
    MAX_CLK: 1800 MHz
    CLK_LOCKED: DISABLED
    DEEP_SLEEP: ENABLED
  GFX_6:
    CLK: 113 MHz
    MIN_CLK: 500 MHz
```

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```
MAX_CLK: 1800 MHz
CLK_LOCKED: DISABLED
DEEP_SLEEP: ENABLED
GFX_7:
  CLK: 113 MHz
  MIN_CLK: 500 MHz
  MAX_CLK: 1800 MHz
  CLK_LOCKED: DISABLED
  DEEP_SLEEP: ENABLED
MEM_0:
  CLK: 900 MHz
  MIN_CLK: 900 MHz
  MAX_CLK: 1200 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: DISABLED
VCLK_0:
  CLK: 29 MHz
  MIN_CLK: 914 MHz
  MAX_CLK: 1480 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: ENABLED
VCLK_1:
  CLK: 29 MHz
  MIN_CLK: 914 MHz
  MAX_CLK: 1480 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: ENABLED
VCLK_2:
  CLK: 29 MHz
  MIN_CLK: 914 MHz
  MAX_CLK: 1480 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: ENABLED
VCLK_3:
  CLK: 29 MHz
  MIN_CLK: 914 MHz
  MAX_CLK: 1480 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: ENABLED
DCLK_0:
  CLK: 22 MHz
  MIN_CLK: 711 MHz
  MAX_CLK: 1233 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: ENABLED
DCLK_1:
  CLK: 22 MHz
  MIN_CLK: 711 MHz
  MAX_CLK: 1233 MHz
  CLK_LOCKED: N/A
  DEEP_SLEEP: ENABLED
DCLK_2:
```

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```

CLK: 22 MHz
MIN_CLK: 711 MHz
MAX_CLK: 1233 MHz
CLK_LOCKED: N/A
DEEP_SLEEP: ENABLED
DCLK_3:
CLK: 22 MHz
MIN_CLK: 711 MHz
MAX_CLK: 1233 MHz
CLK_LOCKED: N/A
DEEP_SLEEP: ENABLED

```

- **Added deferred ecc counts.**

Added deferred error correctable counts to `amd-smi metric --ecc --ecc-blocks`

```

$ amd-smi metric --ecc --ecc-blocks
GPU: 0
ECC:
TOTAL_CORRECTABLE_COUNT: 0
TOTAL_UNCORRECTABLE_COUNT: 0
TOTAL_DEFERRED_COUNT: 0
CACHE_CORRECTABLE_COUNT: 0
CACHE_UNCORRECTABLE_COUNT: 0
ECC_BLOCKS:
  UMC:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
  SDMA:
    CORRECTABLE_COUNT: 0
    UNCORRECTABLE_COUNT: 0
    DEFERRED_COUNT: 0
...

```

- **Updated `amd-smi topology --json` to align with host/guest.**

Topology's `--json` output now is changed to align with output host/guest systems. Additionally, users can select/filter specific topology details as desired (refer to `amd-smi topology -h` for full list). See examples shown below.

Previous format:

```

$ amd-smi topology --json
[
  {
    "gpu": 0,
    "link_accessibility": {
      "gpu_0": "ENABLED",
      "gpu_1": "DISABLED"
    },
    "weight": {
      "gpu_0": 0,
      "gpu_1": 40
    },
  },
]

```

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```

    "hops": {
      "gpu_0": 0,
      "gpu_1": 2
    },
    "link_type": {
      "gpu_0": "SELF",
      "gpu_1": "PCIE"
    },
    "numa_bandwidth": {
      "gpu_0": "N/A",
      "gpu_1": "N/A"
    }
  },
  {
    "gpu": 1,
    "link_accessibility": {
      "gpu_0": "DISABLED",
      "gpu_1": "ENABLED"
    },
    "weight": {
      "gpu_0": 40,
      "gpu_1": 0
    },
    "hops": {
      "gpu_0": 2,
      "gpu_1": 0
    },
    "link_type": {
      "gpu_0": "PCIE",
      "gpu_1": "SELF"
    },
    "numa_bandwidth": {
      "gpu_0": "N/A",
      "gpu_1": "N/A"
    }
  }
]

```

New format:

```

$ amd-smi topology --json
[
  {
    "gpu": 0,
    "bdf": "0000:01:00.0",
    "links": [
      {
        "gpu": 0,
        "bdf": "0000:01:00.0",
        "weight": 0,
        "link_status": "ENABLED",
        "link_type": "SELF",

```

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```

        "num_hops": 0,
        "bandwidth": "N/A",
    },
    {
        "gpu": 1,
        "bdf": "0001:01:00.0",
        "weight": 15,
        "link_status": "ENABLED",
        "link_type": "XGMI",
        "num_hops": 1,
        "bandwidth": "50000-100000",
    },
    ...
]
},
...
]

```

```
$ /opt/rocm/bin/amd-smi topology -a -t --json
```

```

[
  {
    "gpu": 0,
    "bdf": "0000:08:00.0",
    "links": [
      {
        "gpu": 0,
        "bdf": "0000:08:00.0",
        "link_status": "ENABLED",
        "link_type": "SELF"
      },
      {
        "gpu": 1,
        "bdf": "0000:44:00.0",
        "link_status": "DISABLED",
        "link_type": "PCIE"
      }
    ]
  },
  {
    "gpu": 1,
    "bdf": "0000:44:00.0",
    "links": [
      {
        "gpu": 0,
        "bdf": "0000:08:00.0",
        "link_status": "DISABLED",
        "link_type": "PCIE"
      },
      {
        "gpu": 1,
        "bdf": "0000:44:00.0",
        "link_status": "ENABLED",

```

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```

    "link_type": "SELF"
  }
]

```

11.11.2 Resolved issues

- **Fix for GPU reset error on non-amdgpu cards.**
Previously our reset could attempt to reset non-amd GPUS- resulting in “Unable to reset non-amd GPU” error. Fix updates CLI to target only AMD ASICs.
- **Fix for `amd-smi static --pcie` and `amdsmi_get_pcie_info()` Navi32/31 cards.**
Updated API to include `amdsmi_card_form_factor_t.AMDSMI_CARD_FORM_FACTOR_CEM`. Previously, this would report “UNKNOWN”. This fix provides the correct board `SLOT_TYPE` associated with these ASICs (and other Navi cards).
- **Fix for `amd-smi process`.**
Fixed output results when getting processes running on a device.
- **Improved Error handling for `amd-smi process`.**
Fixed Attribute Error when getting process in csv format

11.11.3 Known issues

- `amd-smi bad-pages` can results with “ValueError: NULL pointer access” with certain PM FW versions.

11.12 `amd_smi_lib` for ROCm 6.1.0

11.12.1 Added

- **Added Monitor Command.**
Provides users the ability to customize GPU metrics to capture, collect, and observe. Output is provided in a table view. This aligns closer to ROCm SMI `rocm-smi` (no argument), additionally allows users to customize what data is helpful for their use-case.

```

$ amd-smi monitor -h
usage: amd-smi monitor [-h] [--json | --csv] [--file FILE] [--loglevel LEVEL]
                    [-g GPU [GPU ...] | -U CPU [CPU ...] | -O CORE [CORE ...]]
                    [-w INTERVAL] [-W TIME] [-i ITERATIONS] [-p] [-t] [-u] [-m] [-n]
                    [-d] [-s] [-e] [-v] [-r]

```

Monitor a target device **for** the specified arguments.
If no arguments are provided, all arguments will be enabled.
Use the watch arguments to run continuously

Monitor Arguments:

```

-h, --help                show this help message and exit
-g, --gpu GPU [GPU ...]  Select a GPU ID, BDF, or UUID from the possible choices:
                          ID: 0 | BDF: 0000:01:00.0 | UUID: <redacted>
                          all | Selects all devices
-U, --cpu CPU [CPU ...]  Select a CPU ID from the possible choices:
                          ID: 0

```

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```

                                all | Selects all devices
-O, --core CORE [CORE ...]    Select a Core ID from the possible choices:
                                ID: 0 - 23
                                all | Selects all devices
-w, --watch INTERVAL          Reprint the command in a loop of INTERVAL seconds
-W, --watch_time TIME         The total TIME to watch the given command
-i, --iterations ITERATIONS   Total number of ITERATIONS to loop on the given command
-p, --power-usage             Monitor power usage in Watts
-t, --temperature             Monitor temperature in Celsius
-u, --gfx                     Monitor graphics utilization (%) and clock (MHz)
-m, --mem                    Monitor memory utilization (%) and clock (MHz)
-n, --encoder                 Monitor encoder utilization (%) and clock (MHz)
-d, --decoder                 Monitor decoder utilization (%) and clock (MHz)
-s, --throttle-status         Monitor thermal throttle status
-e, --ecc                     Monitor ECC single bit, ECC double bit, and PCIe replay
↪ error counts
-v, --vram-usage              Monitor memory usage in MB
-r, --pcie                    Monitor PCIe Tx/Rx in MB/s

Command Modifiers:
--json                        Displays output in JSON format (human readable by
↪ default).
--csv                          Displays output in CSV format (human readable by default).
--file FILE                    Saves output into a file on the provided path (stdout by
↪ default).
--loglevel LEVEL               Set the logging level from the possible choices:
                                DEBUG, INFO, WARNING, ERROR, CRITICAL

```

```

$ amd-smi monitor -ptumv
GPU POWER GPU_TEMP MEM_TEMP GFX_UTIL GFX_CLOCK MEM_UTIL MEM_CLOCK VRAM_USED ↵
↪ VRAM_TOTAL
0 171 W 32 °C 33 °C 0 % 114 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB
1 175 W 33 °C 34 °C 0 % 113 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB
2 177 W 31 °C 33 °C 0 % 113 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB
3 172 W 33 °C 32 °C 0 % 113 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB
4 178 W 32 °C 32 °C 0 % 113 MHz 0 % 900 MHz 284 MB ↵
↪ 196300 MB
5 176 W 33 °C 35 °C 0 % 113 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB
6 176 W 32 °C 32 °C 0 % 113 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB
7 175 W 34 °C 32 °C 0 % 113 MHz 0 % 900 MHz 283 MB ↵
↪ 196300 MB

```

- **Integrated ESMI Tool.**

Users can get CPU metrics and telemetry through our API and CLI tools. This information can be seen in `amd-smi static` and `amd-smi metric` commands. Only available for limited target processors. As of ROCm 6.0.2, this is listed as:

- AMD Zen3 based CPU Family 19h Models 0h-Fh and 30h-3Fh
- AMD Zen4 based CPU Family 19h Models 10h-1Fh and A0-AFh

See a few examples listed below.

```
$ amd-smi static -U all
CPU: 0
SMU:
  FW_VERSION: 85.90.0
  INTERFACE_VERSION:
  PROTO_VERSION: 6
```

```
$ amd-smi metric -O 0 1 2
CORE: 0
  BOOST_LIMIT:
    VALUE: 400 MHz
  CURR_ACTIVE_FREQ_CORE_LIMIT:
    VALUE: 400 MHz
  CORE_ENERGY:
    VALUE: N/A

CORE: 1
  BOOST_LIMIT:
    VALUE: 400 MHz
  CURR_ACTIVE_FREQ_CORE_LIMIT:
    VALUE: 400 MHz
  CORE_ENERGY:
    VALUE: N/A

CORE: 2
  BOOST_LIMIT:
    VALUE: 400 MHz
  CURR_ACTIVE_FREQ_CORE_LIMIT:
    VALUE: 400 MHz
  CORE_ENERGY:
    VALUE: N/A
```

```
$ amd-smi metric -U all
CPU: 0
POWER_METRICS:
  SOCKET_POWER: 102675 mW
  SOCKET_POWER_LIMIT: 550000 mW
  SOCKET_MAX_POWER_LIMIT: 550000 mW
PROCHOT:
  PROCHOT_STATUS: 0
FREQ_METRICS:
  FCLKMEMCLK:
    FCLK: 2000 MHz
    MCLK: 1300 MHz
  CCLKFREQLIMIT: 400 MHz
  SOC_CURRENT_ACTIVE_FREQ_LIMIT:
    FREQ: 400 MHz
    FREQ_SRC: [HSMP Agent]
```

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```

SOC_FREQ_RANGE:
  MAX_SOCKET_FREQ: 3700 MHz
  MIN_SOCKET_FREQ: 400 MHz
C0_RESIDENCY:
  RESIDENCY: 4 %
SVI_TELEMETRY_ALL_RAILS:
  POWER: 102673 mW
METRIC_VERSION:
  VERSION: 11
METRICS_TABLE:
  CPU_FAMILY: 25
  CPU_MODEL: 144
RESPONSE:
  MTBL_ACCUMULATION_COUNTER: 2887162626
  MTBL_MAX_SOCKET_TEMPERATURE: 41.0 °C
  MTBL_MAX_VR_TEMPERATURE: 39.0 °C
  MTBL_MAX_HBM_TEMPERATURE: 40.0 °C
  MTBL_MAX_SOCKET_TEMPERATURE_ACC: 108583340881.125 °C
  MTBL_MAX_VR_TEMPERATURE_ACC: 109472702595.0 °C
  MTBL_MAX_HBM_TEMPERATURE_ACC: 111516663941.0 °C
  MTBL_SOCKET_POWER_LIMIT: 550.0 W
  MTBL_MAX_SOCKET_POWER_LIMIT: 550.0 W
  MTBL_SOCKET_POWER: 102.678 W
  MTBL_TIMESTAMP_RAW: 288731677361880
  MTBL_TIMESTAMP_READABLE: Tue Mar 19 12:32:21 2024
  MTBL_SOCKET_ENERGY_ACC: 166127.84 kJ
  MTBL_CCD_ENERGY_ACC: 3317.837 kJ
  MTBL_XCD_ENERGY_ACC: 21889.147 kJ
  MTBL_AID_ENERGY_ACC: 121932.397 kJ
  MTBL_HBM_ENERGY_ACC: 18994.108 kJ
  MTBL_CCLK_FREQUENCY_LIMIT: 3.7 GHz
  MTBL_GFXCLK_FREQUENCY_LIMIT: 0.0 MHz
  MTBL_FCLK_FREQUENCY: 1999.988 MHz
  MTBL_UCLK_FREQUENCY: 1299.993 MHz
  MTBL_SOCCLK_FREQUENCY: [35.716, 35.715, 35.714, 35.714] MHz
  MTBL_VCLK_FREQUENCY: [0.0, 53.749, 53.749, 53.749] MHz
  MTBL_DCLK_FREQUENCY: [7.143, 44.791, 44.791, 44.791] MHz
  MTBL_LCLK_FREQUENCY: [20.872, 18.75, 35.938, 599.558] MHz
  MTBL_FCLK_FREQUENCY_TABLE: [1200.0, 1600.0, 1900.0, 2000.0] MHz
  MTBL_UCLK_FREQUENCY_TABLE: [900.0, 1100.0, 1200.0, 1300.0] MHz
  MTBL_SOCCLK_FREQUENCY_TABLE: [800.0, 1000.0, 1142.857, 1142.857] MHz
  MTBL_VCLK_FREQUENCY_TABLE: [914.286, 1300.0, 1560.0, 1720.0] MHz
  MTBL_DCLK_FREQUENCY_TABLE: [711.111, 975.0, 1300.0, 1433.333] MHz
  MTBL_LCLK_FREQUENCY_TABLE: [600.0, 844.444, 1150.0, 1150.0] MHz
  MTBL_CCLK_FREQUENCY_ACC: [4399751656.639, 4399751656.639, 4399751656.639,
↪4399751656.639,
    4399751656.639, 4399751656.639, 4399751656.639, 4399751656.639,
↪4399751656.639,
    4399751656.639, 4399751656.639, 4399751656.639, 4399751656.639,
↪4399751656.639,
    4399751656.639, 4399751656.639, 4399751656.639, 4399751656.639,
↪4399751656.639,
    4399751656.639,

```

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```

4399751656.639, 4399751656.639, 4399751656.639, 4399751656.639,
↪4399751656.639,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
↪0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
↪0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
↪0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
↪0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0] GHz
MTBL_GFXCLK_FREQUENCY_ACC: [0.0, 0.0, 250534397827.603, 251546257401.82,
↪250811364089.836,
249999070486.505, 251622633562.855, 251342375116.05] MHz
MTBL_GFXCLK_FREQUENCY: [0.0, 0.0, 31.091, 31.414, 31.141, 31.478, 31.32, 31.
↪453]
MHz
MTBL_MAX_CCLK_FREQUENCY: 3.7 GHz
MTBL_MIN_CCLK_FREQUENCY: 0.4 GHz
MTBL_MAX_GFXCLK_FREQUENCY: 2100.0 MHz
MTBL_MIN_GFXCLK_FREQUENCY: 500.0 MHz
MTBL_MAX_LCLK_DPM_RANGE: 2
MTBL_MIN_LCLK_DPM_RANGE: 0
MTBL_XGMI_WIDTH: 0.0
MTBL_XGMI_BITRATE: 0.0 Gbps
MTBL_XGMI_READ_BANDWIDTH_ACC: [0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0] Gbps
MTBL_XGMI_WRITE_BANDWIDTH_ACC: [0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0] Gbps
MTBL_SOCKET_C0_RESIDENCY: 4.329 %
MTBL_SOCKET_GFX_BUSY: 0.0 %
MTBL_HBM_BANDWIDTH_UTILIZATION: 0.001 %
MTBL_SOCKET_C0_RESIDENCY_ACC: 311523106.34
MTBL_SOCKET_GFX_BUSY_ACC: 84739.281
MTBL_HBM_BANDWIDTH_ACC: 33231180.073 Gbps
MTBL_MAX_HBM_BANDWIDTH: 5324.801 Gbps
MTBL_DRAM_BANDWIDTH_UTILIZATION_ACC: 612843.699
MTBL_PCIE_BANDWIDTH_ACC: [0.0, 0.0, 0.0, 0.0] Gbps
MTBL_PROCHOT_RESIDENCY_ACC: 0
MTBL_PPT_RESIDENCY_ACC: 2887162626
MTBL_SOCKET_THM_RESIDENCY_ACC: 2887162626
MTBL_VR_THM_RESIDENCY_ACC: 0
MTBL_HBM_THM_RESIDENCY_ACC: 2887162626
SOCKET_ENERGY:
  RESPONSE: N/A
DDR_BANDWIDTH:
  RESPONSE: N/A
CPU_TEMP:
  RESPONSE: N/A

```

- **Added support for new metrics: VCN, JPEG engines, and PCIe errors.**

Using the AMD SMI tool, users can retrieve VCN, JPEG engines, and PCIe errors by calling `amd-smi metric -P` or `amd-smi metric --usage`. Depending on device support, `VCN_ACTIVITY` will update for MI3x ASICs (with 4 separate VCN engine activities) for older ASICs `MM_ACTIVITY` with UVD/VCN engine activity (average of all engines). `JPEG_ACTIVITY` is a new field for MI3x ASICs, where device can support up to 32 JPEG engine

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GPU2	0000:38:00.0	32 Gb/s	512 Gb/s	XGMI				
Read					0 KB	1 KB	N/A	└
↪	2 KB	1 KB	2 KB	0 KB	0 KB			
Write					0 KB	1 KB	N/A	└
↪	1 KB	1 KB	1 KB	1 KB	1 KB			
GPU3	0000:5c:00.0	32 Gb/s	512 Gb/s	XGMI				
Read					0 KB	0 KB	2 KB	└
↪	N/A	1 KB	0 KB	0 KB	2 KB			
Write					0 KB	1 KB	1 KB	└
↪	N/A	1 KB	1 KB	1 KB	1 KB			
GPU4	0000:9f:00.0	32 Gb/s	512 Gb/s	XGMI				
Read					0 KB	1 KB	0 KB	└
↪	0 KB	N/A	2 KB	0 KB	2 KB			
Write					0 KB	1 KB	1 KB	└
↪	1 KB	N/A	1 KB	1 KB	1 KB			
GPU5	0000:af:00.0	32 Gb/s	512 Gb/s	XGMI				
Read					0 KB	2 KB	0 KB	└
↪	0 KB	0 KB	N/A	2 KB	0 KB			
Write					0 KB	1 KB	1 KB	└
↪	1 KB	1 KB	N/A	1 KB	1 KB			
GPU6	0000:bf:00.0	32 Gb/s	512 Gb/s	XGMI				
Read					0 KB	0 KB	0 KB	└
↪	0 KB	0 KB	0 KB	N/A	0 KB			
Write					0 KB	1 KB	1 KB	└
↪	1 KB	1 KB	1 KB	N/A	1 KB			
GPU7	0000:df:00.0	32 Gb/s	512 Gb/s	XGMI				
Read					0 KB	0 KB	0 KB	└
↪	0 KB	0 KB	0 KB	0 KB	N/A			
Write					0 KB	1 KB	1 KB	└
↪	1 KB	1 KB	1 KB	1 KB	N/A			

• **Added units of measure to JSON output.**

We added unit of measure to JSON/CSV amd-smi metric, amd-smi static, and amd-smi monitor commands.

Ex.

```
amd-smi metric -p --json
[
  {
    "gpu": 0,
    "power": {
      "socket_power": {
        "value": 10,
        "unit": "W"
      },
      "gfx_voltage": {
        "value": 6,
        "unit": "mV"
      },
      "soc_voltage": {
        "value": 918,
        "unit": "mV"
      }
    }
  }
]
```

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```

    },
    "mem_voltage": {
        "value": 1250,
        "unit": "mV"
    },
    "power_management": "ENABLED",
    "throttle_status": "UNTHROTTLED"
}
]

```

11.12.2 Changed

- **Topology is now left-aligned with BDF of each device listed individual table's row/columns.**

We provided each device's BDF for every table's row/columns, then left aligned data. We want AMD SMI Tool output to be easy to understand and digest for our users. Having users scroll up to find this information made it difficult to follow, especially for devices which have many devices associated with one ASIC.

```

$ amd-smi topology
ACCESS TABLE:
      0000:0c:00.0 0000:22:00.0 0000:38:00.0 0000:5c:00.0 0000:9f:00.0 0000:af:00.
↪ 0 0000:bf:00.0 0000:df:00.0
0000:0c:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:22:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:38:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:5c:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:9f:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:af:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:bf:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED
0000:df:00.0 ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ENABLED    ↵
↪  ENABLED    ENABLED

WEIGHT TABLE:
      0000:0c:00.0 0000:22:00.0 0000:38:00.0 0000:5c:00.0 0000:9f:00.0 0000:af:00.
↪ 0 0000:bf:00.0 0000:df:00.0
0000:0c:00.0 0      15      15      15      15      15      ↵
↪ 15      15
0000:22:00.0 15     0      15      15      15      15      ↵
↪ 15      15
0000:38:00.0 15     15     0      15      15      15      ↵
↪ 15      15
0000:5c:00.0 15     15     15     0      15      15      ↵
↪ 15      15
0000:9f:00.0 15     15     15     15     0      15      ↵
↪ 15      15

```

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0000:af:00.0	15	15	15	15	15	0	└
→ 15	15						
0000:bf:00.0	15	15	15	15	15	15	└
→ 0	15						
0000:df:00.0	15	15	15	15	15	15	└
→ 15	0						

HOPS TABLE:

	0000:0c:00.0	0000:22:00.0	0000:38:00.0	0000:5c:00.0	0000:9f:00.0	0000:af:00.0	
→ 0 0000:bf:00.0	0000:df:00.0						
0000:0c:00.0	0	1	1	1	1	1	└
→ 1	1						
0000:22:00.0	1	0	1	1	1	1	└
→ 1	1						
0000:38:00.0	1	1	0	1	1	1	└
→ 1	1						
0000:5c:00.0	1	1	1	0	1	1	└
→ 1	1						
0000:9f:00.0	1	1	1	1	0	1	└
→ 1	1						
0000:af:00.0	1	1	1	1	1	0	└
→ 1	1						
0000:bf:00.0	1	1	1	1	1	1	└
→ 0	1						
0000:df:00.0	1	1	1	1	1	1	└
→ 1	0						

LINK TYPE TABLE:

	0000:0c:00.0	0000:22:00.0	0000:38:00.0	0000:5c:00.0	0000:9f:00.0	0000:af:00.0	
→ 0 0000:bf:00.0	0000:df:00.0						
0000:0c:00.0	SELF	XGMI	XGMI	XGMI	XGMI	XGMI	└
→ XGMI	XGMI						
0000:22:00.0	XGMI	SELF	XGMI	XGMI	XGMI	XGMI	└
→ XGMI	XGMI						
0000:38:00.0	XGMI	XGMI	SELF	XGMI	XGMI	XGMI	└
→ XGMI	XGMI						
0000:5c:00.0	XGMI	XGMI	XGMI	SELF	XGMI	XGMI	└
→ XGMI	XGMI						
0000:9f:00.0	XGMI	XGMI	XGMI	XGMI	SELF	XGMI	└
→ XGMI	XGMI						
0000:af:00.0	XGMI	XGMI	XGMI	XGMI	XGMI	SELF	└
→ XGMI	XGMI						
0000:bf:00.0	XGMI	XGMI	XGMI	XGMI	XGMI	XGMI	└
→ SELF	XGMI						
0000:df:00.0	XGMI	XGMI	XGMI	XGMI	XGMI	XGMI	└
→ XGMI	SELF						

NUMA BW TABLE:

	0000:0c:00.0	0000:22:00.0	0000:38:00.0	0000:5c:00.0	0000:9f:00.0	0000:af:00.0	
→ 0 0000:bf:00.0	0000:df:00.0						
0000:0c:00.0	N/A	50000-50000	50000-50000	50000-50000	50000-50000	50000-	
→ 50000	50000-50000	50000-50000					

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0000:22:00.0	50000-50000	N/A	50000-50000	50000-50000	50000-50000	50000-		
↪	50000	50000-50000	50000-50000					
0000:38:00.0	50000-50000	50000-50000	N/A	50000-50000	50000-50000	50000-		
↪	50000	50000-50000	50000-50000					
0000:5c:00.0	50000-50000	50000-50000	50000-50000	N/A	50000-50000	50000-		
↪	50000	50000-50000	50000-50000					
0000:9f:00.0	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	N/A	50000-	
↪	50000	50000-50000	50000-50000					
0000:af:00.0	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	N/A	
↪	50000-50000	50000-50000						
0000:bf:00.0	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	50000-	
↪	50000	N/A	50000-50000					
0000:df:00.0	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	50000-50000	50000-	
↪	50000	50000-50000	N/A					

11.12.3 Resolved issues

- **Fix for Navi3X/Navi2X/MI100 `amdsmi_get_gpu_pci_bandwidth()` in `frequencies_read` tests.**
Devices which do not report (eg. Navi3X/Navi2X/MI100) we have added checks to confirm these devices return `AMDSMI_STATUS_NOT_SUPPORTED`. Otherwise, tests now display a return string.
- **Fix for devices which have an older `pyyaml` installed.**
Platforms which are identified as having an older `pyyaml` version or `pip`, we no manually update both `pip` and `pyyaml` as needed. This corrects issues identified below. Fix impacts the following CLI commands:
 - `amd-smi list`
 - `amd-smi static`
 - `amd-smi firmware`
 - `amd-smi metric`
 - `amd-smi topology`

```
TypeError: dump_all() got an unexpected keyword argument 'sort_keys'
```

- **Fix for crash when user is not a member of video/render groups.**
AMD SMI now uses same mutex handler for devices as `rocm-smi`. This helps avoid crashes when DRM/device data is inaccessible to the logged in user.

11.13 `amd_smi_lib` for ROCm 6.0.0

11.13.1 Added

- **Integrated the E-SMI (EPYC-SMI) library.**
You can now query CPU-related information directly through AMD SMI. Metrics include power, energy, performance, and other system details.
- **Added support for `gfx942` metrics.**
You can now query MI300 device metrics to get real-time information. Metrics include power, temperature, energy, and performance.
- **Compute and memory partition support.**
Users can now view, set, and reset partitions. The topology display can provide a more in-depth look at the device's current configuration.

11.13.2 Changed

- **GPU index sorting made consistent with other tools.**
To ensure alignment with other ROCm software tools, GPU index sorting is optimized to use Bus:Device.Function (BDF) rather than the card number.
- **Topology output is now aligned with GPU BDF table.**
Earlier versions of the topology output were difficult to read since each GPU was displayed linearly. Now the information is displayed as a table by each GPU's BDF, which closer resembles rocm-smi output.

11.13.3 Optimized

- Updated to C++17, gtest-1.14, and cmake 3.14

11.13.4 Resolved issues

- **Fix for driver not initialized.**
If driver module is not loaded, user retrieve error reponse indicating amdgpu module is not loaded.

RELIABILITY, AVAILABILITY, SERVICEABILITY (RAS)

RAS aims to increase the robustness of a system by detecting hardware errors, recording them, and correcting them where possible. See [Reliability, availability, serviceability \(Linux kernel\)](#) for more general information.

12.1 ECC

ECC (Error-Correcting Code) is a type of memory to automatically detect errors. Correctable 1-bit errors are handled by the ECC logic and logged by the hardware. Uncorrectable 2-bit errors can be detected but not reliably fixed; this is a more serious event that must be reported. See [RAS Error Count sysfs Interface](#) to learn how AMD SMI accesses error counts.

While ECC is a mechanism to handle different errors, CPER is the standard used to report that the event occurred.

12.2 CPER

At its core, CPER (Common Platform Error Record) is a standard format included in the [UEFI specification](#) to report errors to the operating system. It works as a standard error report template that different hardware components can fill out when something goes wrong. It consists of a header, one or more section descriptors – and for each descriptor, an associated section containing error or informational data. See [CPER \(UEFI Specification\)](#) for more information.

A CPER record consists of vital information for diagnostics such as:

- Error source
- Error type
- Error severity
 - 0 - Recoverable (also called non-fatal uncorrected)
 - 1 - Fatal
 - 2 - Corrected
 - 3 - Informational
- Timestamp
- Other data

A CPER record might contain an AFID in its data to help map a complex error to a more actionable service task.

12.3 AFID

AFIDs (AMD Field ID) are unique numerical IDs associated with specific events or errors produced by AMD Instinct accelerators. It provides a specific identifier for a known condition, which helps facilitate root cause analysis. Each AFID is associated with category, type, and severity fields. See [AFID Event List](#) for more information.

12.4 From concept to action

AMD SMI provides tools to programmatically monitor and manage these RAS features.

C/C++

The AMD SMI library provides APIs to query ECC error counts and manage CPER records (list, decode, and clear). See ECC information and RAS information for available APIs.

Python

See related APIs:

- `amdsmi_get_gpu_ecc_count`
- `amdsmi_get_gpu_ecc_enabled`
- `amdsmi_get_gpu_ecc_status`
- `amdsmi_get_gpu_total_ecc_count`
- `amdsmi_get_gpu_cper_entries`
- `amdsmi_get_afids_from_cper`
- `amdsmi_get_gpu_ras_feature_info`
- `amdsmi_get_gpu_ras_block_features_enabled`

amd-smi CLI

See `amd-smi ras --help` for details and available options.

```
amd-smi ras --help
```

12.5 Further reading

- [AMD Field ID](#)
- [CPER \(UEFI specification\)](#)
- [Reliability, availability, serviceability \(Linux kernel\)](#)

**CHAPTER
THIRTEEN**

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