

ROCmSMI

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## Chapter 1

# ROCm System Management Interface (ROCm SMI) Library

The ROCm System Management Interface Library, or ROCm SMI library, is part of the Radeon Open Compute [ROCm](#) software stack . It is a C library for Linux that provides a user space interface for applications to monitor and control GPU applications.

### Important note about Versioning and Backward Compatibility

The ROCm SMI library is currently under development, and therefore subject to change either at the ABI or API level. The intention is to keep the API as stable as possible even while in development, but in some cases we may need to break backwards compatibility in order to ensure future stability and usability. Following [Semantic Versioning](#) rules, while the ROCm SMI library is in high state of change, the major version will remain 0, and backward compatibility is not ensured.

Once new development has leveled off, the major version will become greater than 0, and backward compatibility will be enforced between major versions.

### Building ROCm SMI

#### Additional Required software for building

In order to build the ROCm SMI library, the following components are required. Note that the software versions listed are what was used in development. Earlier versions are not guaranteed to work:

- CMake (v3.5.0)
- g++ (5.4.0)

In order to build the latest documentation, the following are required:

- DOxygen (1.8.11)
- latex (pdfTeX 3.14159265-2.6-1.40.16)

The source code for ROCm SMI is available on [Github](#).

After the ROCm SMI library git repository has been cloned to a local Linux machine, building the library is achieved by following the typical CMake build sequence. Specifically,

```
$ mk -p build
```

```
$ cd build
```

```
$ cmake <location of root of ROCm SMI library CMakeLists.txt>
```

```
$ make
```

```
# Install library file and header; default location is /opt/rocm
```

```
$ make install
```

The built library will appear in the `build` folder.

### Building the Documentation

The documentation PDF file can be built with the following steps (continued from the steps above):

```
$ make doc
```

```
$ cd latex
```

```
$ make
```

The reference manual, `refman.pdf` will be in the `latex` directory upon a successful build.

### Building the Tests

In order to verify the build and capability of ROCm SMI on your system and to see an example of how ROCm SMI can be used, you may build and run the tests that are available in the repo. To build the tests, follow these steps:

```
# Set environment variables used in CMakeLists.txt file
```

```
$ ROCM_DIR=<location of ROCm SMI library>
```

```
$ mkdir <location for test build>
```

```
$ cd <location for test build>
```

```
$ cmake -DROCM_DIR=<location of ROCM SMI library .so> <ROCm SMI source root>/tests/rocm_smi_test
```

```
“$ make
```

To run the test, execute the program `rsmitst` that is built from the steps above.

---

## Usage Basics

### Device Indices

Many of the functions in the library take a "device index". The device index is a number greater than or equal to 0, and less than the number of devices detected, as determined by `rsmi_num_monitor_devices()`. The index is used to distinguish the detected devices from one another. It is important to note that a device may end up with a different index after a reboot, so an index should not be relied upon to be constant over reboots.

### Hello ROCm SMI

The only required ROCm-SMI call for any program that wants to use ROCm-SMI is the `rsmi_init()` call. This call initializes some internal data structures that will be used by subsequent ROCm-SMI calls.

When ROCm-SMI is no longer being used, `rsmi_shut_down()` should be called. This provides a way to do any releasing of resources that ROCm-SMI may have held. In many cases, this may have no effect, but may be necessary in future versions of the library.

A simple "Hello World" type program that displays the device ID of detected devices would look like this:

```
1 #include <stdint.h>
2 #include "rocm_smi/rocm_smi.h"
3 int main() {
4     rsmi_status_t ret;
5     uint32_t num_devices;
6     uint64_t dev_id;
7
8     // We will skip return code checks for this example, but it
9     // is recommended to always check this as some calls may not
10    // apply for some devices or ROCm releases
11
12    ret = rsmi_init(0);
13    ret = rsmi_num_monitor_devices(&num_devices);
14
15    for (int i=0; i < num_devices; ++i) {
16        ret = rsmi_dev_id_get(i, &dev_id);
17        // dev_id holds the device ID of device i, upon a
18        // successful call
19    }
20    ret = rsmi_shut_down();
21    return 0;
22 }
```



## Chapter 2

# Module Index

### 2.1 Modules

Here is a list of all modules:

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## Chapter 3

# Data Structure Index

### 3.1 Data Structures

Here are the data structures with brief descriptions:

<a href="#">id</a>	This union holds the value of an <a href="#">rsmi_func_id_iter_handle_t</a> . The value may be a function name, or an enumerated variant value of types such as <a href="#">rsmi_memory_type_t</a> , <a href="#">rsmi_temperature_metric_t</a> , etc . . . . .	65
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<a href="#">rsmi_power_profile_status_t</a>	This structure contains information about which power profiles are supported by the system for a given device, and which power profile is currently active . . . . .	71
<a href="#">rsmi_process_info_t</a>	This structure contains information specific to a process . . . . .	71
<a href="#">rsmi_range_t</a>	This structure represents a range (e.g., frequencies or voltages) . . . . .	72
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## Chapter 4

# File Index

### 4.1 File List

Here is a list of all documented files with brief descriptions:

[rocm\\_smi.h](#)

The rocm\_smi library api is new, and therefore subject to change either at the ABI or API level. Instead of marking every function prototype as "unstable", we are instead saying the API is unstable (i.e., changes are possible) while the major version remains 0. This means that if the API/ABI changes, we will not increment the major version to 1. Once the ABI stabilizes, we will increment the major version to 1, and thereafter increment it on all ABI breaks . . . . .

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## Chapter 5

# Module Documentation

### 5.1 Initialization and Shutdown

#### Functions

- [rsmi\\_status\\_t rsmi\\_init](#) (uint64\_t init\_flags)  
*Initialize ROCm SMI.*
- [rsmi\\_status\\_t rsmi\\_shut\\_down](#) (void)  
*Shutdown ROCm SMI.*

#### 5.1.1 Detailed Description

These functions are used for initialization of ROCm SMI and clean up when done.

#### 5.1.2 Function Documentation

##### 5.1.2.1 [rsmi\\_status\\_t rsmi\\_init](#) ( uint64\_t *init\_flags* )

Initialize ROCm SMI.

When called, this initializes internal data structures, including those corresponding to sources of information that SMI provides.

#### Parameters

in	<i>init_flags</i>	Bit flags that tell SMI how to initialize. Values of <a href="#">rsmi_init_flags_t</a> may be OR'd together and passed through <i>init_flags</i> to modify how RSMI initializes.
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#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	is returned upon successful call.
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### 5.1.2.2 `rsmi_status_t rsmi_shut_down ( void )`

Shutdown ROCm SMI.

Do any necessary clean up.

## 5.2 Identifier Queries

### Functions

- `rsmi_status_t rsmi_num_monitor_devices` (`uint32_t *num_devices`)  
*Get the number of devices that have monitor information.*
- `rsmi_status_t rsmi_dev_id_get` (`uint32_t dv_ind`, `uint16_t *id`)  
*Get the device id associated with the device with provided device index.*
- `rsmi_status_t rsmi_dev_vendor_id_get` (`uint32_t dv_ind`, `uint16_t *id`)  
*Get the device vendor id associated with the device with provided device index.*
- `rsmi_status_t rsmi_dev_name_get` (`uint32_t dv_ind`, `char *name`, `size_t len`)  
*Get the name string of a gpu device.*
- `rsmi_status_t rsmi_dev_brand_get` (`uint32_t dv_ind`, `char *brand`, `uint32_t len`)  
*Get the brand string of a gpu device.*
- `rsmi_status_t rsmi_dev_vendor_name_get` (`uint32_t dv_ind`, `char *name`, `size_t len`)  
*Get the name string for a give vendor ID.*
- `rsmi_status_t rsmi_dev_vram_vendor_get` (`uint32_t dv_ind`, `char *brand`, `uint32_t len`)  
*Get the vram vendor string of a gpu device.*
- `rsmi_status_t rsmi_dev_serial_number_get` (`uint32_t dv_ind`, `char *serial_num`, `uint32_t len`)  
*Get the serial number string for a device.*
- `rsmi_status_t rsmi_dev_subsystem_id_get` (`uint32_t dv_ind`, `uint16_t *id`)  
*Get the subsystem device id associated with the device with provided device index.*
- `rsmi_status_t rsmi_dev_subsystem_name_get` (`uint32_t dv_ind`, `char *name`, `size_t len`)  
*Get the name string for the device subsystem.*
- `rsmi_status_t rsmi_dev_drm_render_minor_get` (`uint32_t dv_ind`, `uint32_t *minor`)  
*Get the drm minor number associated with this device.*
- `rsmi_status_t rsmi_dev_subsystem_vendor_id_get` (`uint32_t dv_ind`, `uint16_t *id`)  
*Get the device subsystem vendor id associated with the device with provided device index.*
- `rsmi_status_t rsmi_dev_unique_id_get` (`uint32_t dv_ind`, `uint64_t *id`)  
*Get Unique ID.*

### 5.2.1 Detailed Description

These functions provide identification information.

### 5.2.2 Function Documentation

#### 5.2.2.1 `rsmi_status_t rsmi_num_monitor_devices ( uint32_t * num_devices )`

Get the number of devices that have monitor information.

The number of devices which have monitors is returned. Monitors are referenced by the index which can be between 0 and `num_devices - 1`.

#### Parameters

<code>in, out</code>	<code>num_devices</code>	Caller provided pointer to <code>uint32_t</code> . Upon successful call, the value <code>num_devices</code> will contain the number of monitor devices.
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## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
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5.2.2.2 `rsmi_status_t rsmi_dev_id_get ( uint32_t dv_ind, uint16_t * id )`

Get the device id associated with the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint32_t id`, this function will write the device id value to the `uint64_t` pointed to by `id`. This ID is an identification of the type of device, so calling this function for different devices will give the same value if they are kind of device. Consequently, this function should not be used to distinguish one device from another. [`rsmi\_dev\_pci\_id\_get\(\)`](#) should be used to get a unique identifier.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>id</i>	a pointer to <code>uint64_t</code> to which the device id will be written If this parameter is nullptr, this function will return <a href="#"><code>RSMI_STATUS_INVALID_ARGS</code></a> if the function is supported with the provided, arguments and <a href="#"><code>RSMI_STATUS_NOT_SUPPORTED</code></a> if it is not supported with the provided arguments.

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid

5.2.2.3 `rsmi_status_t rsmi_dev_vendor_id_get ( uint32_t dv_ind, uint16_t * id )`

Get the device vendor id associated with the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint32_t id`, this function will write the device vendor id value to the `uint64_t` pointed to by `id`.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>id</i>	a pointer to <code>uint64_t</code> to which the device vendor id will be written If this parameter is nullptr, this function will return <a href="#"><code>RSMI_STATUS_INVALID_ARGS</code></a> if the function is supported with the provided, arguments and <a href="#"><code>RSMI_STATUS_NOT_SUPPORTED</code></a> if it is not supported with the provided arguments.

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid



#### 5.2.2.4 `rsmi_status_t rsmi_dev_name_get ( uint32_t dv_ind, char * name, size_t len )`

Get the name string of a gpu device.

Given a device index `dv_ind`, a pointer to a caller provided char buffer `name`, and a length of this buffer `len`, this function will write the name of the device (up to `len` characters) to the buffer `name`.

If the integer ID associated with the device is not found in one of the system files containing device name information (e.g. `/usr/share/misc/pci.ids`), then this function will return the hex device ID as a string. Updating the system name files can be accomplished with "sudo update-pciids".

##### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>name</i>	a pointer to a caller provided char buffer to which the name will be written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.
in	<i>len</i>	the length of the caller provided buffer <code>name</code> .

##### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid
<a href="#">RSMI_STATUS_INSUFFICIENT_SIZE</a>	is returned if <code>len</code> bytes is not large enough to hold the entire name. In this case, only <code>len</code> bytes will be written.

#### 5.2.2.5 `rsmi_status_t rsmi_dev_brand_get ( uint32_t dv_ind, char * brand, uint32_t len )`

Get the brand string of a gpu device.

Given a device index `dv_ind`, a pointer to a caller provided char buffer `brand`, and a length of this buffer `len`, this function will write the brand of the device (up to `len` characters) to the buffer `brand`.

If the sku associated with the device is not found as one of the values contained within `rsmi_dev_brand_get`, then this function will return the device marketing name as a string instead of the brand name.

##### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>brand</i>	a pointer to a caller provided char buffer to which the brand will be written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.
in	<i>len</i>	the length of the caller provided buffer <code>brand</code> .

##### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
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## Return values

<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_INSUFFICIENT_SIZE</i></a>	is returned if <code>len</code> bytes is not large enough to hold the entire name. In this case, only <code>len</code> bytes will be written.

5.2.2.6 `rsmi_status_t rsmi_dev_vendor_name_get ( uint32_t dv_ind, char * name, size_t len )`

Get the name string for a give vendor ID.

Given a device index `dv_ind`, a pointer to a caller provided char buffer `name`, and a length of this buffer `len`, this function will write the name of the vendor (up to `len` characters) buffer `name`. The `id` may be a device vendor or subsystem vendor ID.

If the integer ID associated with the vendor is not found in one of the system files containing device name information (e.g. `/usr/share/misc/pci.ids`), then this function will return the hex vendor ID as a string. Updating the system name files can be accomplished with "sudo update-pciids".

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>name</i>	a pointer to a caller provided char buffer to which the name will be written If this parameter is nullptr, this function will return <a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a> if the function is supported with the provided, arguments and <a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a> if it is not supported with the provided arguments.
in	<i>len</i>	the length of the caller provided buffer <code>name</code> .

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_INSUFFICIENT_SIZE</i></a>	is returned if <code>len</code> bytes is not large enough to hold the entire name. In this case, only <code>len</code> bytes will be written.

5.2.2.7 `rsmi_status_t rsmi_dev_vram_vendor_get ( uint32_t dv_ind, char * brand, uint32_t len )`

Get the vram vendor string of a gpu device.

Given a device index `dv_ind`, a pointer to a caller provided char buffer `brand`, and a length of this buffer `len`, this function will write the vram vendor of the device (up to `len` characters) to the buffer `brand`.

If the vram vendor for the device is not found as one of the values contained within `rsmi_dev_vram_vendor_get`, then this function will return the string 'unknown' instead of the vram vendor.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>brand</i>	a pointer to a caller provided char buffer to which the vram vendor will be written
in	<i>len</i>	the length of the caller provided buffer <i>brand</i> .

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
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5.2.2.8 `rsmi_status_t rsmi_dev_serial_number_get ( uint32_t dv_ind, char * serial_num, uint32_t len )`

Get the serial number string for a device.

Given a device index *dv\_ind*, a pointer to a buffer of chars *serial\_num*, and the length of the provided buffer *len*, this function will write the serial number string (up to *len* characters) to the buffer pointed to by *serial\_num*.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>serial_num</i>	a pointer to caller-provided memory to which the serial number will be written If this parameter is nullptr, this function will return <a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a> if the function is supported with the provided, arguments and <a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a> if it is not supported with the provided arguments.
in	<i>len</i>	the length of the caller provided buffer <i>serial_num</i> .

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_INSUFFICIENT_SIZE</i></a>	is returned if <i>len</i> bytes is not large enough to hold the entire name. In this case, only <i>len</i> bytes will be written.

5.2.2.9 `rsmi_status_t rsmi_dev_subsystem_id_get ( uint32_t dv_ind, uint16_t * id )`

Get the subsystem device id associated with the device with provided device index.

Given a device index *dv\_ind* and a pointer to a `uint32_t id`, this function will write the subsystem device id value to the `uint64_t` pointed to by *id*.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>id</i>	a pointer to <code>uint64_t</code> to which the subsystem device id will be written If this parameter is nullptr, this function will return <a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a> if the function is supported with the provided, arguments and <a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a> if it is not supported with the provided arguments.
Generated by Doxygen		

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid

5.2.2.10 `rsmi_status_t rsmi_dev_subsystem_name_get ( uint32_t dv_ind, char * name, size_t len )`

Get the name string for the device subsystem.

Given a device index `dv_ind`, a pointer to a caller provided char buffer `name`, and a length of this buffer `len`, this function will write the name of the device subsystem (up to `len` characters) to the buffer `name`.

If the integer ID associated with the sub-system is not found in one of the system files containing device name information (e.g. `/usr/share/misc/pci.ids`), then this function will return the hex sub-system ID as a string. Updating the system name files can be accomplished with "sudo update-pciids".

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>name</i>	a pointer to a caller provided char buffer to which the name will be written. If this parameter is nullptr, this function will return <a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a> if the function is supported with the provided arguments and <a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a> if it is not supported with the provided arguments.
in	<i>len</i>	the length of the caller provided buffer <code>name</code> .

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_INSUFFICIENT_SIZE</i></a>	is returned if <code>len</code> bytes is not large enough to hold the entire name. In this case, only <code>len</code> bytes will be written.

5.2.2.11 `rsmi_status_t rsmi_dev_drm_render_minor_get ( uint32_t dv_ind, uint32_t * minor )`

Get the drm minor number associated with this device.

Given a device index `dv_ind`, find its render device file `/dev/dri/renderDN` where N corresponds to its minor number.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>minor</i>	a pointer to a <code>uint32_t</code> into which minor number will be copied

## Return values

	:	RSMI_STATUS_SUCCESS is returned upon successful call.
	:	RSMI_STATUS_INIT_ERROR if failed to get minor number during initialization.
<a href="#">RSMI_STATUS_INVALID_ARGS</a>		the provided arguments are not valid

5.2.2.12 `rsmi_status_t rsmi_dev_subsystem_vendor_id_get ( uint32_t dv_ind, uint16_t * id )`

Get the device subsystem vendor id associated with the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint32_t id`, this function will write the device subsystem vendor id value to the `uint64_t` pointed to by `id`.

## Parameters

in	<code>dv_ind</code>	a device index
in, out	<code>id</code>	a pointer to <code>uint64_t</code> to which the device subsystem vendor id will be written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

## Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

5.2.2.13 `rsmi_status_t rsmi_dev_unique_id_get ( uint32_t dv_ind, uint64_t * id )`

Get Unique ID.

Given a device index `dv_ind` and a pointer to a `uint64_t id`, this function will write the unique ID of the GPU pointed to `id`.

## Parameters

in	<code>dv_ind</code>	a device index
in, out	<code>id</code>	a pointer to <code>uint64_t</code> to which the unique ID of the GPU is written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

## Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments

## Return values

<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
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## 5.3 PCIe Queries

### Functions

- `rsmi_status_t rsmi_dev_pci_bandwidth_get` (uint32\_t dv\_ind, `rsmi_pcie_bandwidth_t` \*bandwidth)  
*Get the list of possible PCIe bandwidths that are available.*
- `rsmi_status_t rsmi_dev_pci_id_get` (uint32\_t dv\_ind, uint64\_t \*bdfid)  
*Get the unique PCI device identifier associated for a device.*
- `rsmi_status_t rsmi_dev_pci_throughput_get` (uint32\_t dv\_ind, uint64\_t \*sent, uint64\_t \*received, uint64\_t \*max\_pkt\_sz)  
*Get PCIe traffic information.*
- `rsmi_status_t rsmi_dev_pci_replay_counter_get` (uint32\_t dv\_ind, uint64\_t \*counter)  
*Get PCIe replay counter.*

### 5.3.1 Detailed Description

These functions provide information about PCIe.

### 5.3.2 Function Documentation

#### 5.3.2.1 `rsmi_status_t rsmi_dev_pci_bandwidth_get ( uint32_t dv_ind, rsmi_pcie_bandwidth_t * bandwidth )`

Get the list of possible PCIe bandwidths that are available.

Given a device index `dv_ind` and a pointer to a `rsmi_pcie_bandwidth_t` structure `bandwidth`, this function will fill in `bandwidth` with the possible T/s values and associated number of lanes, and indication of the current selection.

#### Parameters

in	<code>dv_ind</code>	a device index
in, out	<code>bandwidth</code>	a pointer to a caller provided <code>rsmi_pcie_bandwidth_t</code> structure to which the frequency information will be written

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	is returned upon successful call.
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#### 5.3.2.2 `rsmi_status_t rsmi_dev_pci_id_get ( uint32_t dv_ind, uint64_t * bdfid )`

Get the unique PCI device identifier associated for a device.

Give a device index `dv_ind` and a pointer to a `uint64_t` `bdfid`, this function will write the Bus/Device/Function PCI identifier (BDFID) associated with device `dv_ind` to the value pointed to by `bdfid`.

The format of `bdfid` will be as follows:

```
BDFID = ((DOMAIN & 0xffffffff) << 32) | ((BUS & 0xff) << 8) |
        ((DEVICE & 0x1f) << 3) | (FUNCTION & 0x7)
```

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

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>bdfid</i>	a pointer to <code>uint64_t</code> to which the device bdfid value will be written. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

5.3.2.3 `rsmi_status_t rsmi_dev_pci_throughput_get ( uint32_t dv_ind, uint64_t * sent, uint64_t * received, uint64_t * max_pkt_sz )`

Get PCIe traffic information.

Give a device index `dv_ind` and pointers to a `uint64_t`'s, `sent`, `received` and `max_pkt_sz`, this function will write the number of bytes sent and received in 1 second to `sent` and `received`, respectively. The maximum possible packet size will be written to `max_pkt_sz`.

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>sent</i>	a pointer to <code>uint64_t</code> to which the number of bytes sent will be written in 1 second. If pointer is <code>NULL</code> , it will be ignored.
in, out	<i>received</i>	a pointer to <code>uint64_t</code> to which the number of bytes received will be written. If pointer is <code>NULL</code> , it will be ignored.
in, out	<i>max_pkt_sz</i>	a pointer to <code>uint64_t</code> to which the maximum packet size will be written. If pointer is <code>NULL</code> , it will be ignored.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	is returned upon successful call.
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments



#### 5.3.2.4 `rsmi_status_t rsmi_dev_pci_replay_counter_get ( uint32_t dv_ind, uint64_t * counter )`

Get PCIe replay counter.

Given a device index `dv_ind` and a pointer to a `uint64_t counter`, this function will write the sum of the number of NAK's received by the GPU and the NAK's generated by the GPU to memory pointed to by `counter`.

##### Parameters

<code>in</code>	<code>dv_ind</code>	a device index
<code>in, out</code>	<code>counter</code>	a pointer to <code>uint64_t</code> to which the sum of the NAK's received and generated by the GPU is written. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

##### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

## 5.4 PCIe Control

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_bandwidth\\_set](#) (uint32\_t dv\_ind, uint64\_t bw\_bitmask)

*Control the set of allowed PCIe bandwidths that can be used.*

#### 5.4.1 Detailed Description

These functions provide some control over PCIe.

#### 5.4.2 Function Documentation

##### 5.4.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_bandwidth\\_set](#) ( uint32\_t dv\_ind, uint64\_t bw\_bitmask )

Control the set of allowed PCIe bandwidths that can be used.

Given a device index `dv_ind` and a 64 bit bitmask `bw_bitmask`, this function will limit the set of allowable bandwidths. If a bit in `bw_bitmask` has a value of 1, then the frequency (as ordered in an [rsmi\\_frequencies\\_t](#) returned by [rsmi\\_dev\\_gpu\\_clk\\_freq\\_get\(\)](#)) corresponding to that bit index will be allowed.

This function will change the performance level to [RSMI\\_DEV\\_PERF\\_LEVEL\\_MANUAL](#) in order to modify the set of allowable band\_widths. Caller will need to set to [RSMI\\_DEV\\_PERF\\_LEVEL\\_AUTO](#) in order to get back to default state.

All bits with indices greater than or equal to the value of the [rsmi\\_frequencies\\_t::num\\_supported](#) field of [rsmi\\_pcie\\_bandwidth\\_t](#) will be ignored.

#### Parameters

in	<code>dv_ind</code>	a device index
in	<code>bw_bitmask</code>	A bitmask indicating the indices of the bandwidths that are to be enabled (1) and disabled (0). Only the lowest <a href="#">rsmi_frequencies_t::num_supported</a> (of <a href="#">rsmi_pcie_bandwidth_t</a> ) bits of this mask are relevant.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_PERMISSION</a>	function requires root access

## 5.5 Power Queries

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_ave\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*power)  
*Get the average power consumption of the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*cap)  
*Get the cap on power which, when reached, causes the system to take action to reduce power.*
- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_range\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*max, uint64\_t \*min)  
*Get the range of valid values for the power cap.*

### 5.5.1 Detailed Description

These functions provide information about power usage.

### 5.5.2 Function Documentation

#### 5.5.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_power\\_ave\\_get](#) ( uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \* power )

Get the average power consumption of the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint64_t power`, this function will write the current average power consumption (in microwatts) to the `uint64_t` pointed to by `power`.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>power</i>	a pointer to <code>uint64_t</code> to which the average power consumption will be written. If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

#### 5.5.2.2 [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_get](#) ( uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \* cap )

Get the cap on power which, when reached, causes the system to take action to reduce power.

When power use rises above the value `power`, the system will take action to reduce power use. The power level returned through `power` will be in microWatts.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>cap</i>	a pointer to a <code>uint64_t</code> that indicates the power cap, in microwatts. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<a href="#"><code>RSMI_STATUS_SUCCESS</code></a>	call was successful
<a href="#"><code>RSMI_STATUS_NOT_SUPPORTED</code></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><code>RSMI_STATUS_INVALID_ARGS</code></a>	the provided arguments are not valid

#### 5.5.2.3 `rsmi_status_t rsmi_dev_power_cap_range_get ( uint32_t dv_ind, uint32_t sensor_ind, uint64_t * max, uint64_t * min )`

Get the range of valid values for the power cap.

This function will return the maximum possible valid power cap `max` and the minimum possible valid power cap `min`.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>max</i>	a pointer to a <code>uint64_t</code> that indicates the maximum possible power cap, in microwatts. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.
in, out	<i>min</i>	a pointer to a <code>uint64_t</code> that indicates the minimum possible power cap, in microwatts. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<a href="#"><code>RSMI_STATUS_SUCCESS</code></a>	call was successful
<a href="#"><code>RSMI_STATUS_NOT_SUPPORTED</code></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><code>RSMI_STATUS_INVALID_ARGS</code></a>	the provided arguments are not valid

## 5.6 Power Control

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_set](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t cap)  
*Set the power cap value.*
- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_profile\\_set](#) (uint32\_t dv\_ind, uint32\_t reserved, [rsmi\\_power\\_profile\\_preset↔\\_masks\\_t](#) profile)  
*Set the power profile.*

### 5.6.1 Detailed Description

These functions provide ways to control power usage.

### 5.6.2 Function Documentation

#### 5.6.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_set](#) ( uint32\_t *dv\_ind*, uint32\_t *sensor\_ind*, uint64\_t *cap* )

Set the power cap value.

This function will set the power cap to the provided value *cap*. *cap* must be between the minimum and maximum power cap values set by the system, which can be obtained from [rsmi\\_dev\\_power\\_cap\\_range\\_get](#).

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in	<i>cap</i>	a uint64_t that indicates the desired power cap, in microwatts

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	is returned upon successful call.
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid
<a href="#">RSMI_STATUS_PERMISSION</a>	function requires root access

#### 5.6.2.2 [rsmi\\_status\\_t rsmi\\_dev\\_power\\_profile\\_set](#) ( uint32\_t *dv\_ind*, uint32\_t *reserved*, [rsmi\\_power\\_profile\\_preset\\_masks\\_t](#) *profile* )

Set the power profile.

Given a device index *dv\_ind* and a *profile*, this function will attempt to set the current profile to the provided profile. The provided profile must be one of the currently supported profiles, as indicated by a call to [rsmi\\_dev↔power\\_profile\\_presets\\_get\(\)](#)

**Parameters**

in	<i>dv_ind</i>	a device index
in	<i>reserved</i>	Not currently used. Set to 0.
in	<i>profile</i>	a <a href="#">rsmi_power_profile_preset_masks_t</a> that hold the mask of the desired new power profile

**Return values**

<a href="#">RSMI_STATUS_SUCCESS</a>	is returned upon successful call.
<a href="#">RSMI_STATUS_PERMISSION</a>	function requires root access

## 5.7 Memory Queries

### Functions

- `rsmi_status_t rsmi_dev_memory_total_get` (`uint32_t dv_ind`, `rsmi_memory_type_t mem_type`, `uint64_t *total`)  
Get the total amount of memory that exists.
- `rsmi_status_t rsmi_dev_memory_usage_get` (`uint32_t dv_ind`, `rsmi_memory_type_t mem_type`, `uint64_t *used`)  
Get the current memory usage.
- `rsmi_status_t rsmi_dev_memory_busy_percent_get` (`uint32_t dv_ind`, `uint32_t *busy_percent`)  
Get percentage of time any device memory is being used.
- `rsmi_status_t rsmi_dev_memory_reserved_pages_get` (`uint32_t dv_ind`, `uint32_t *num_pages`, `rsmi_retired_page_record_t *records`)  
Get information about reserved ("retired") memory pages.

### 5.7.1 Detailed Description

These functions provide information about memory systems.

### 5.7.2 Function Documentation

#### 5.7.2.1 `rsmi_status_t rsmi_dev_memory_total_get ( uint32_t dv_ind, rsmi_memory_type_t mem_type, uint64_t * total )`

Get the total amount of memory that exists.

Given a device index `dv_ind`, a type of memory `mem_type`, and a pointer to a `uint64_t total`, this function will write the total amount of `mem_type` memory that exists to the location pointed to by `total`.

#### Parameters

in	<code>dv_ind</code>	a device index
in	<code>mem_type</code>	The type of memory for which the total amount will be found
in, out	<code>total</code>	a pointer to <code>uint64_t</code> to which the total amount of memory will be written If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided, arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

**5.7.2.2** `rsmi_status_t rsmi_dev_memory_usage_get ( uint32_t dv_ind, rsmi_memory_type_t mem_type, uint64_t * used )`

Get the current memory usage.

Given a device index `dv_ind`, a type of memory `mem_type`, and a pointer to a `uint64_t` `usage`, this function will write the amount of `mem_type` memory that is currently being used to the location pointed to by `total`.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>mem_type</i>	The type of memory for which the amount being used will be found
in, out	<i>used</i>	a pointer to <code>uint64_t</code> to which the amount of memory currently being used will be written. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

**5.7.2.3** `rsmi_status_t rsmi_dev_memory_busy_percent_get ( uint32_t dv_ind, uint32_t * busy_percent )`

Get percentage of time any device memory is being used.

Given a device index `dv_ind`, this function returns the percentage of time that any device memory is being used for the specified device.

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>busy_percent</i>	a pointer to the <code>uint32_t</code> to which the busy percent will be written. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid



```
5.7.2.4 rsmi_status_t rsmi_dev_memory_reserved_pages_get ( uint32_t dv_ind, uint32_t * num_pages,
rsmi_retired_page_record_t * records )
```

Get information about reserved ("retired") memory pages.

Given a device index `dv_ind`, this function returns retired page information `records` corresponding to the device with the provided device index `dv_ind`. The number of retired page records is returned through `num_pages`. `records` may be NULL on input. In this case, the number of records available for retrieval will be returned through `num_pages`.

#### Parameters

in	<code>dv_ind</code>	a device index
in, out	<code>num_pages</code>	a pointer to a uint32. As input, the value passed through this parameter is the number of <code>rsmi_retired_page_record_t</code> 's that may be safely written to the memory pointed to by <code>records</code> . This is the limit on how many records will be written to <code>records</code> . On return, <code>num_pages</code> will contain the number of records written to <code>records</code> , or the number of records that could have been written if enough memory had been provided. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.
in, out	<code>records</code>	A pointer to a block of memory to which the <code>rsmi_retired_page_record_t</code> values will be written. This value may be NULL. In this case, this function can be used to query how many records are available to read.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid
<code>RSMI_STATUS_INSUFFICIENT_SIZE</code>	is returned if more records were available than allowed by the provided, allocated memory.

## 5.8 Physical State Queries

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_rpms\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, int64\_t \*speed)  
*Get the fan speed in RPMs of the device with the specified device index and 0-based sensor index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_speed\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, int64\_t \*speed)  
*Get the fan speed for the specified device as a value relative to [RSMI\\_MAX\\_FAN\\_SPEED](#).*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_speed\\_max\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*max\_speed)  
*Get the max. fan speed of the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_temp\\_metric\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_type, [rsmi\\_temperature\\_metric\\_t](#) metric, int64\_t \*temperature)  
*Get the temperature metric value for the specified metric, from the specified temperature sensor on the specified device.*

### 5.8.1 Detailed Description

These functions provide information about the physical characteristics of the device.

### 5.8.2 Function Documentation

#### 5.8.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_rpms\\_get](#) ( uint32\_t *dv\_ind*, uint32\_t *sensor\_ind*, int64\_t \* *speed* )

Get the fan speed in RPMs of the device with the specified device index and 0-based sensor index.

Given a device index *dv\_ind* and a pointer to a uint32\_t *speed*, this function will write the current fan speed in RPMs to the uint32\_t pointed to by *speed*

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>speed</i>	a pointer to uint32_t to which the speed will be written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

### 5.8.2.2 `rsmi_status_t rsmi_dev_fan_speed_get ( uint32_t dv_ind, uint32_t sensor_ind, int64_t * speed )`

Get the fan speed for the specified device as a value relative to [RSMI\\_MAX\\_FAN\\_SPEED](#).

Given a device index `dv_ind` and a pointer to a `uint32_t speed`, this function will write the current fan speed (a value between 0 and the maximum fan speed, [RSMI\\_MAX\\_FAN\\_SPEED](#)) to the `uint32_t` pointed to by `speed`

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>speed</i>	a pointer to <code>uint32_t</code> to which the speed will be written. If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

### 5.8.2.3 `rsmi_status_t rsmi_dev_fan_speed_max_get ( uint32_t dv_ind, uint32_t sensor_ind, uint64_t * max_speed )`

Get the max. fan speed of the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint32_t max_speed`, this function will write the maximum fan speed possible to the `uint32_t` pointed to by `max_speed`

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>max_speed</i>	a pointer to <code>uint32_t</code> to which the maximum speed will be written. If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

**5.8.2.4** `rsmi_status_t rsmi_dev_temp_metric_get ( uint32_t dv_ind, uint32_t sensor_type, rsmi_temperature_metric_t metric, int64_t* temperature )`

Get the temperature metric value for the specified metric, from the specified temperature sensor on the specified device.

Given a device index `dv_ind`, a sensor type `sensor_type`, a `rsmi_temperature_metric_t` `metric` and a pointer to an `int64_t` `temperature`, this function will write the value of the metric indicated by `metric` and `sensor_type` to the memory location `temperature`.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_type</i>	part of device from which temperature should be obtained. This should come from the enum <code>rsmi_temperature_type_t</code>
in	<i>metric</i>	enum indicated which temperature value should be retrieved
in, out	<i>temperature</i>	a pointer to <code>int64_t</code> to which the temperature will be written, in millidegrees Celcius. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

## 5.9 Physical State Control

### Functions

- `rsmi_status_t rsmi_dev_fan_reset (uint32_t dv_ind, uint32_t sensor_ind)`  
*Reset the fan to automatic driver control.*
- `rsmi_status_t rsmi_dev_fan_speed_set (uint32_t dv_ind, uint32_t sensor_ind, uint64_t speed)`  
*Set the fan speed for the specified device with the provided speed, in RPMs.*

### 5.9.1 Detailed Description

These functions provide control over the physical state of a device.

### 5.9.2 Function Documentation

#### 5.9.2.1 `rsmi_status_t rsmi_dev_fan_reset ( uint32_t dv_ind, uint32_t sensor_ind )`

Reset the fan to automatic driver control.

This function returns control of the fan to the system

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.

#### Return values

<i><a href="#">RSMI_STATUS_SUCCESS</a></i>	is returned upon successful call.
<i><a href="#">RSMI_STATUS_NOT_SUPPORTED</a></i>	installed software or hardware does not support this function with the given arguments

#### 5.9.2.2 `rsmi_status_t rsmi_dev_fan_speed_set ( uint32_t dv_ind, uint32_t sensor_ind, uint64_t speed )`

Set the fan speed for the specified device with the provided speed, in RPMs.

Given a device index *dv\_ind* and a integer value indicating speed *speed*, this function will attempt to set the fan speed to *speed*. An error will be returned if the specified speed is outside the allowable range for the device. The maximum value is 255 and the minimum is 0.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in	<i>speed</i>	the speed to which the function will attempt to set the fan

## Return values

<i>RSMI_STATUS_SUCCESS</i>	is returned upon successful call.
<i>RSMI_STATUS_NOT_SUPPORTED</i>	installed software or hardware does not support this function with the given arguments
<i>RSMI_STATUS_PERMISSION</i>	function requires root access

## 5.10 Clock, Power and Performance Queries

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_busy\\_percent\\_get](#) (uint32\_t dv\_ind, uint32\_t \*busy\_percent)  
*Get percentage of time device is busy doing any processing.*
- [rsmi\\_status\\_t rsmi\\_dev\\_perf\\_level\\_get](#) (uint32\_t dv\_ind, [rsmi\\_dev\\_perf\\_level\\_t](#) \*perf)  
*Get the performance level of the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_overdrive\\_level\\_get](#) (uint32\_t dv\_ind, uint32\_t \*od)  
*Get the overdrive percent associated with the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_gpu\\_clk\\_freq\\_get](#) (uint32\_t dv\_ind, [rsmi\\_clk\\_type\\_t](#) clk\_type, [rsmi\\_frequencies\\_t](#) \*f)  
*Get the list of possible system clock speeds of device for a specified clock type.*
- [rsmi\\_status\\_t rsmi\\_dev\\_od\\_volt\\_info\\_get](#) (uint32\_t dv\_ind, [rsmi\\_od\\_volt\\_freq\\_data\\_t](#) \*odv)  
*This function retrieves the voltage/frequency curve information.*
- [rsmi\\_status\\_t rsmi\\_dev\\_od\\_volt\\_curve\\_regions\\_get](#) (uint32\_t dv\_ind, uint32\_t \*num\_regions, [rsmi\\_freq\\_volt\\_region\\_t](#) \*buffer)  
*This function will retrieve the current valid regions in the frequency/voltage space.*
- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_profile\\_presets\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, [rsmi\\_power\\_profile\\_status\\_t](#) \*status)  
*Get the list of available preset power profiles and an indication of which profile is currently active.*

### 5.10.1 Detailed Description

These functions provide information about clock frequencies and performance.

### 5.10.2 Function Documentation

#### 5.10.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_busy\\_percent\\_get](#) ( uint32\_t dv\_ind, uint32\_t \* busy\_percent )

Get percentage of time device is busy doing any processing.

Given a device index `dv_ind`, this function returns the percentage of time that the specified device is busy. The device is considered busy if any one or more of its sub-blocks are working, and idle if none of the sub-blocks are working.

#### Parameters

in	<code>dv_ind</code>	a device index
in, out	<code>busy_percent</code>	a pointer to the <code>uint32_t</code> to which the busy percent will be written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

### 5.10.2.2 `rsmi_status_t rsmi_dev_perf_level_get ( uint32_t dv_ind, rsmi_dev_perf_level_t * perf )`

Get the performance level of the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint32_t perf`, this function will write the `rsmi_dev_perf_level_t` to the `uint32_t` pointed to by `perf`

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>perf</i>	a pointer to <code>rsmi_dev_perf_level_t</code> to which the performance level will be written. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

### 5.10.2.3 `rsmi_status_t rsmi_dev_overdrive_level_get ( uint32_t dv_ind, uint32_t * od )`

Get the overdrive percent associated with the device with provided device index.

Given a device index `dv_ind` and a pointer to a `uint32_t od`, this function will write the overdrive percentage to the `uint32_t` pointed to by `od`

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>od</i>	a pointer to <code>uint32_t</code> to which the overdrive percentage will be written. If this parameter is <code>nullptr</code> , this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

### 5.10.2.4 `rsmi_status_t rsmi_dev_gpu_clk_freq_get ( uint32_t dv_ind, rsmi_clk_type_t clk_type, rsmi_frequencies_t * f )`

Get the list of possible system clock speeds of device for a specified clock type.



Given a device index `dv_ind`, a clock type `clk_type`, and a pointer to a to an [rsmi\\_frequencies\\_t](#) structure `f`, this function will fill in `f` with the possible clock speeds, and indication of the current clock speed selection.

## Parameters

in	<code>dv_ind</code>	a device index
in	<code>clk_type</code>	the type of clock for which the frequency is desired
in, out	<code>f</code>	a pointer to a caller provided <a href="#">rsmi_frequencies_t</a> structure to which the frequency information will be written. Frequency values are in Hz. If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

## Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

#### 5.10.2.5 `rsmi_status_t rsmi_dev_od_volt_info_get ( uint32_t dv_ind, rsmi_od_volt_freq_data_t * odv )`

This function retrieves the voltage/frequency curve information.

Given a device index `dv_ind` and a pointer to a [rsmi\\_od\\_volt\\_freq\\_data\\_t](#) structure `odv`, this function will populate `odv`. See [rsmi\\_od\\_volt\\_freq\\_data\\_t](#) for more details.

## Parameters

in	<code>dv_ind</code>	a device index
in, out	<code>odv</code>	a pointer to an <a href="#">rsmi_od_volt_freq_data_t</a> structure If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

## Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

#### 5.10.2.6 `rsmi_status_t rsmi_dev_od_volt_curve_regions_get ( uint32_t dv_ind, uint32_t * num_regions, rsmi_freq_volt_region_t * buffer )`

This function will retrieve the current valid regions in the frequency/voltage space.

Given a device index `dv_ind`, a pointer to an unsigned integer `num_regions` and a buffer of [rsmi\\_freq\\_volt\\_↵\\_region\\_t](#) structures, `buffer`, this function will populate `buffer` with the current frequency-volt space regions.

The caller should assign `buffer` to memory that can be written to by this function. The caller should also indicate the number of `rsmi_freq_volt_region_t` structures that can safely be written to `buffer` in `num_regions`.

The number of regions to expect this function provide (`num_regions`) can be obtained by calling `rsmi_dev_odv_volt_info_get()`.

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>num_regions</i>	As input, this is the number of <code>rsmi_freq_volt_region_t</code> structures that can be written to <code>buffer</code> . As output, this is the number of <code>rsmi_freq_volt_region_t</code> structures that were actually written. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.
in, out	<i>buffer</i>	a caller provided buffer to which <code>rsmi_freq_volt_region_t</code> structures will be written. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

#### Return values

<i>RSMI_STATUS_SUCCESS</i>	call was successful
<i>RSMI_STATUS_NOT_SUPPORTED</i>	installed software or hardware does not support this function with the given arguments
<i>RSMI_STATUS_INVALID_ARGS</i>	the provided arguments are not valid

#### 5.10.2.7 `rsmi_status_t rsmi_dev_power_profile_presets_get ( uint32_t dv_ind, uint32_t sensor_ind, rsmi_power_profile_status_t * status )`

Get the list of available preset power profiles and an indication of which profile is currently active.

Given a device index `dv_ind` and a pointer to a `rsmi_power_profile_status_t` `status`, this function will set the bits of the `rsmi_power_profile_status_t.available_profiles` bit field of `status` to 1 if the profile corresponding to the respective `rsmi_power_profile_preset_masks_t` profiles are enabled. For example, if both the VIDEO and VR power profiles are available selections, then `RSMI_PWR_PROF_PRST_VIDEO_MASK` AND'ed with `rsmi_power_profile_status_t.available_profiles` will be non-zero as will `RSMI_PWR_PROF_PRST_VR_MASK` AND'ed with `rsmi_power_profile_status_t.available_profiles`. Additionally, `rsmi_power_profile_status_t.current` will be set to the `rsmi_power_profile_preset_masks_t` of the profile that is currently active.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>sensor_ind</i>	a 0-based sensor index. Normally, this will be 0. If a device has more than one sensor, it could be greater than 0.
in, out	<i>status</i>	a pointer to <code>rsmi_power_profile_status_t</code> that will be populated by a call to this function. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

## Return values

<i>RSMI_STATUS_SUCCESS</i>	call was successful
<i>RSMI_STATUS_NOT_SUPPORTED</i>	installed software or hardware does not support this function with the given arguments
<i>RSMI_STATUS_INVALID_ARGS</i>	the provided arguments are not valid

## 5.11 Clock, Power and Performance Control

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_perf\\_level\\_set](#) (int32\_t dv\_ind, [rsmi\\_dev\\_perf\\_level\\_t](#) perf\_lvl)  
*Set the PowerPlay performance level associated with the device with provided device index with the provided value.*
- [rsmi\\_status\\_t rsmi\\_dev\\_overdrive\\_level\\_set](#) (int32\_t dv\_ind, uint32\_t od)  
*Set the overdrive percent associated with the device with provided device index with the provided value. See details for WARNING.*
- [rsmi\\_status\\_t rsmi\\_dev\\_gpu\\_clk\\_freq\\_set](#) (uint32\_t dv\_ind, [rsmi\\_clk\\_type\\_t](#) clk\_type, uint64\_t freq\_bitmask)  
*Control the set of allowed frequencies that can be used for the specified clock.*

### 5.11.1 Detailed Description

These functions provide control over clock frequencies, power and performance.

### 5.11.2 Function Documentation

#### 5.11.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_perf\\_level\\_set](#) ( int32\_t dv\_ind, [rsmi\\_dev\\_perf\\_level\\_t](#) perf\_lvl )

Set the PowerPlay performance level associated with the device with provided device index with the provided value.

Given a device index `dv_ind` and an [rsmi\\_dev\\_perf\\_level\\_t](#) `perf_level`, this function will set the PowerPlay performance level for the device to the value `perf_lvl`.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>perf_lvl</i>	the value to which the performance level should be set

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	is returned upon successful call.
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_PERMISSION</a>	function requires root access

#### 5.11.2.2 [rsmi\\_status\\_t rsmi\\_dev\\_overdrive\\_level\\_set](#) ( int32\_t dv\_ind, uint32\_t od )

Set the overdrive percent associated with the device with provided device index with the provided value. See details for WARNING.

Given a device index `dv_ind` and an overdrive level `od`, this function will set the overdrive level for the device to the value `od`. The overdrive level is an integer value between 0 and 20, inclusive, which represents the overdrive percentage; e.g., a value of 5 specifies an overclocking of 5%.

The overdrive level is specific to the gpu system clock.

The overdrive level is the percentage above the maximum Performance Level to which overclocking will be limited. The overclocking percentage does not apply to clock speeds other than the maximum. This percentage is limited to 20%.

\*\*\*\*\*WARNING\*\*\*\*\* Operating your AMD GPU outside of official AMD specifications or outside of factory settings, including but not limited to the conducting of overclocking (including use of this overclocking software, even if such software has been directly or indirectly provided by AMD or otherwise affiliated in any way with AMD), may cause damage to your AMD GPU, system components and/or result in system failure, as well as cause other problems. DAMAGES CAUSED BY USE OF YOUR AMD GPU OUTSIDE OF OFFICIAL AMD SPECIFICATIONS OR OUTSIDE OF FACTORY SETTINGS ARE NOT COVERED UNDER ANY AMD PRODUCT WARRANTY AND MAY NOT BE COVERED BY YOUR BOARD OR SYSTEM MANUFACTURER'S WARRANTY. Please use this utility with caution.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>od</i>	the value to which the overdrive level should be set

#### Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_PERMISSION</i></a>	function requires root access

#### 5.11.2.3 `rsmi_status_t rsmi_dev_gpu_clk_freq_set ( uint32_t dv_ind, rsmi_clk_type_t clk_type, uint64_t freq_bitmask )`

Control the set of allowed frequencies that can be used for the specified clock.

Given a device index `dv_ind`, a clock type `clk_type`, and a 64 bit bitmask `freq_bitmask`, this function will limit the set of allowable frequencies. If a bit in `freq_bitmask` has a value of 1, then the frequency (as ordered in an [`rsmi\_frequencies\_t`](#) returned by [`rsmi\_dev\_gpu\_clk\_freq\_get\(\)`](#)) corresponding to that bit index will be allowed.

This function will change the performance level to [`RSMI\_DEV\_PERF\_LEVEL\_MANUAL`](#) in order to modify the set of allowable frequencies. Caller will need to set to [`RSMI\_DEV\_PERF\_LEVEL\_AUTO`](#) in order to get back to default state.

All bits with indices greater than or equal to [`rsmi\_frequencies\_t::num\_supported`](#) will be ignored.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>clk_type</i>	the type of clock for which the set of frequencies will be modified
in	<i>freq_bitmask</i>	A bitmask indicating the indices of the frequencies that are to be enabled (1) and disabled (0). Only the lowest <a href="#"><code>rsmi_frequencies_t::num_supported</code></a> bits of this mask are relevant.

#### Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
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## Return values

<i>RSMI_STATUS_NOT_SUPPORTED</i>	installed software or hardware does not support this function with the given arguments
<i>RSMI_STATUS_PERMISSION</i>	function requires root access

## 5.12 Version Queries

### Functions

- `rsmi_status_t rsmi_version_get (rsmi_version_t *version)`  
*Get the build version information for the currently running build of RSMI.*
- `rsmi_status_t rsmi_version_str_get (rsmi_sw_component_t component, char *ver_str, uint32_t len)`  
*Get the driver version string for the current system.*
- `rsmi_status_t rsmi_dev_vbios_version_get (uint32_t dv_ind, char *vbios, uint32_t len)`  
*Get the VBIOS identifier string.*
- `rsmi_status_t rsmi_dev_firmware_version_get (uint32_t dv_ind, rsmi_fw_block_t block, uint64_t *fw_version)`  
*Get the firmware versions for a device.*

### 5.12.1 Detailed Description

These functions provide version information about various subsystems.

### 5.12.2 Function Documentation

#### 5.12.2.1 `rsmi_status_t rsmi_version_get ( rsmi_version_t * version )`

Get the build version information for the currently running build of RSMI.

Get the major, minor, patch and build string for RSMI build currently in use through `version`

#### Parameters

<code>in, out</code>	<code>version</code>	A pointer to an <code>rsmi_version_t</code> structure that will be updated with the version information upon return.
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#### Return values

<code>RSMI_STATUS_SUCCESS</code>	is returned upon successful call
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#### 5.12.2.2 `rsmi_status_t rsmi_version_str_get ( rsmi_sw_component_t component, char * ver_str, uint32_t len )`

Get the driver version string for the current system.

Given a software component `component`, a pointer to a char buffer, `ver_str`, this function will write the driver version string (up to `len` characters) for the current system to `ver_str`. The caller must ensure that it is safe to write at least `len` characters to `ver_str`.

#### Parameters

<code>in</code>	<code>component</code>	The component for which the version string is being requested
<code>in, out</code>	<code>ver_str</code>	A pointer to a buffer of char's to which the version of <code>component</code> will be written
<code>in</code>	<code>len</code>	the length of the caller provided buffer <code>name</code> .

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_INSUFFICIENT_SIZE</i></a>	is returned if <code>len</code> bytes is not large enough to hold the entire name. In this case, only <code>len</code> bytes will be written.

5.12.2.3 `rsmi_status_t rsmi_dev_vbios_version_get ( uint32_t dv_ind, char * vbios, uint32_t len )`

Get the VBIOS identifier string.

Given a device ID `dv_ind`, and a pointer to a char buffer, `vbios`, this function will write the VBIOS string (up to `len` characters) for device `dv_ind` to `vbios`. The caller must ensure that it is safe to write at least `len` characters to `vbios`.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>vbios</i>	A pointer to a buffer of char's to which the VBIOS name will be written. If this parameter is nullptr, this function will return <a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a> if the function is supported with the provided arguments and <a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a> if it is not supported with the provided arguments.
in	<i>len</i>	The number of char's pointed to by <code>vbios</code> which can safely be written to by this function.

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	call was successful
<a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a>	installed software or hardware does not support this function with the given arguments
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid

5.12.2.4 `rsmi_status_t rsmi_dev_firmware_version_get ( uint32_t dv_ind, rsmi_fw_block_t block, uint64_t * fw_version )`

Get the firmware versions for a device.

Given a device ID `dv_ind`, and a pointer to a `uint64_t`, `fw_version`, this function will write the FW Versions as a string (up to `len` characters) for device `dv_ind` to `vbios`. The caller must ensure that it is safe to write at least `len` characters to `vbios`.

## Parameters

in	<i>dv_ind</i>	a device index
in	<i>block</i>	The firmware block for which the version is being requested
in, out	<i>fw_version</i>	The version for the firmware block. If this parameter is nullptr, this function will return <a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a> if the function is supported with the provided arguments and <a href="#"><i>RSMI_STATUS_NOT_SUPPORTED</i></a> if it is not supported with the provided arguments.



## Return values

<i>RSMI_STATUS_SUCCESS</i>	call was successful
<i>RSMI_STATUS_NOT_SUPPORTED</i>	installed software or hardware does not support this function with the given arguments
<i>RSMI_STATUS_INVALID_ARGS</i>	the provided arguments are not valid

## 5.13 Error Queries

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_count\\_get](#) (uint32\_t *dv\_ind*, [rsmi\\_gpu\\_block\\_t](#) *block*, [rsmi\\_error\\_count\\_t](#) \**ec*)  
Retrieve the error counts for a GPU block.
- [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_enabled\\_get](#) (uint32\_t *dv\_ind*, uint64\_t \**enabled\_blocks*)  
Retrieve the enabled ECC bit-mask.
- [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_status\\_get](#) (uint32\_t *dv\_ind*, [rsmi\\_gpu\\_block\\_t](#) *block*, [rsmi\\_ras\\_err\\_state\\_t](#) \**state*)  
Retrieve the ECC status for a GPU block.
- [rsmi\\_status\\_t rsmi\\_status\\_string](#) ([rsmi\\_status\\_t](#) *status*, const char \*\**status\_string*)  
Get a description of a provided RSMI error status.

### 5.13.1 Detailed Description

These functions provide error information about RSMI calls as well as device errors.

### 5.13.2 Function Documentation

#### 5.13.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_count\\_get](#) ( uint32\_t *dv\_ind*, [rsmi\\_gpu\\_block\\_t](#) *block*, [rsmi\\_error\\_count\\_t](#) \* *ec* )

Retrieve the error counts for a GPU block.

Given a device index *dv\_ind*, an [rsmi\\_gpu\\_block\\_t](#) *block* and a pointer to an [rsmi\\_error\\_count\\_t](#) *ec*, this function will write the error count values for the GPU block indicated by *block* to memory pointed to by *ec*.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>block</i>	The block for which error counts should be retrieved
in, out	<i>ec</i>	A pointer to an <a href="#">rsmi_error_count_t</a> to which the error counts should be written. If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

#### 5.13.2.2 [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_enabled\\_get](#) ( uint32\_t *dv\_ind*, uint64\_t \* *enabled\_blocks* )

Retrieve the enabled ECC bit-mask.

Given a device index `dv_ind`, and a pointer to a `uint64_t` `enabled_mask`, this function will write bits to memory pointed to by `enabled_blocks`. Upon a successful call, `enabled_blocks` can then be AND'd with elements of the `rsmi_gpu_block_t` enumeration to determine if the corresponding block has ECC enabled. Note that whether a block has ECC enabled or not in the device is independent of whether there is kernel support for error counting for that block. Although a block may be enabled, but there may not be kernel support for reading error counters for that block.

## Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>enabled_blocks</i>	A pointer to a <code>uint64_t</code> to which the enabled blocks bits will be written. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

## Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

#### 5.13.2.3 `rsmi_status_t rsmi_dev_ecc_status_get ( uint32_t dv_ind, rsmi_gpu_block_t block, rsmi_ras_err_state_t * state )`

Retrieve the ECC status for a GPU block.

Given a device index `dv_ind`, an `rsmi_gpu_block_t` `block` and a pointer to an `rsmi_ras_err_state_t` `state`, this function will write the current state for the GPU block indicated by `block` to memory pointed to by `state`.

## Parameters

in	<i>dv_ind</i>	a device index
in	<i>block</i>	The block for which error counts should be retrieved
in, out	<i>state</i>	A pointer to an <code>rsmi_ras_err_state_t</code> to which the ECC state should be written. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

## Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid

#### 5.13.2.4 `rsmi_status_t rsmi_status_string ( rsmi_status_t status, const char ** status_string )`

Get a description of a provided RSMI error status.

Set the provided pointer to a const char \*, `status_string`, to a string containing a description of the provided error code `status`.

**Parameters**

<code>in</code>	<code>status</code>	The error status for which a description is desired
<code>in, out</code>	<code>status_string</code>	A pointer to a const char * which will be made to point to a description of the provided error code

**Return values**

<code><a href="#">RSMI_STATUS_SUCCESS</a></code>	is returned upon successful call
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## 5.14 Performance Counter Functions

### Functions

- `rsmi_status_t rsmi_dev_counter_group_supported (uint32_t dv_ind, rsmi_event_group_t group)`  
Tell if an event group is supported by a given device.
- `rsmi_status_t rsmi_dev_counter_create (uint32_t dv_ind, rsmi_event_type_t type, rsmi_event_handle_t *evnt_handle)`  
Create a performance counter object.
- `rsmi_status_t rsmi_dev_counter_destroy (rsmi_event_handle_t evnt_handle)`  
Deallocate a performance counter object.
- `rsmi_status_t rsmi_counter_control (rsmi_event_handle_t evt_handle, rsmi_counter_command_t cmd, void *cmd_args)`  
Issue performance counter control commands.
- `rsmi_status_t rsmi_counter_read (rsmi_event_handle_t evt_handle, rsmi_counter_value_t *value)`  
Read the current value of a performance counter.
- `rsmi_status_t rsmi_counter_available_counters_get (uint32_t dv_ind, rsmi_event_group_t grp, uint32_t *available)`  
Get the number of currently available counters.

### 5.14.1 Detailed Description

These functions are used to configure, query and control performance counting.

### 5.14.2 Function Documentation

#### 5.14.2.1 `rsmi_status_t rsmi_dev_counter_group_supported ( uint32_t dv_ind, rsmi_event_group_t group )`

Tell if an event group is supported by a given device.

Given a device index `dv_ind` and an event group specifier `group`, tell if `group` type events are supported by the device associated with `dv_ind`

#### Parameters

in	<code>dv_ind</code>	device index of device being queried
in	<code>group</code>	<code>rsmi_event_group_t</code> identifier of group for which support is being queried

#### Return values

<code>RSMI_STATUS_SUCCESS</code>	if the device associated with <code>dv_ind</code> support counting events of the type indicated by <code>group</code> .
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments <code>group</code>

#### 5.14.2.2 `rsmi_status_t rsmi_dev_counter_create ( uint32_t dv_ind, rsmi_event_type_t type, rsmi_event_handle_t * evnt_handle )`

Create a performance counter object.

Create a performance counter object of type `type` for the device with a device index of `dv_ind`, and write a handle to the object to the memory location pointed to by `evnt_handle`. `evnt_handle` can be used with other performance event operations. The handle should be deallocated with `rsmi_dev_counter_destroy()` when no longer needed.

##### Parameters

in	<code>dv_ind</code>	a device index
in	<code>type</code>	the type of performance event to create
in, out	<code>evnt_handle</code>	A pointer to a <code>rsmi_event_handle_t</code> which will be associated with a newly allocated counter. If this parameter is nullptr, this function will return <code>RSMI_STATUS_INVALID_ARGS</code> if the function is supported with the provided arguments and <code>RSMI_STATUS_NOT_SUPPORTED</code> if it is not supported with the provided arguments.

##### Return values

<code>RSMI_STATUS_SUCCESS</code>	call was successful
<code>RSMI_STATUS_NOT_SUPPORTED</code>	installed software or hardware does not support this function with the given arguments
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid
<code>RSMI_STATUS_OUT_OF_RESOURCES</code>	unable to allocate memory for counter
<code>RSMI_STATUS_PERMISSION</code>	function requires root access

#### 5.14.2.3 `rsmi_status_t rsmi_dev_counter_destroy ( rsmi_event_handle_t evnt_handle )`

Deallocate a performance counter object.

Deallocate the performance counter object with the provided `rsmi_event_handle_t evnt_handle`

##### Parameters

in	<code>evnt_handle</code>	handle to event object to be deallocated
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##### Return values

<code>RSMI_STATUS_SUCCESS</code>	is returned upon successful call
<code>RSMI_STATUS_INVALID_ARGS</code>	the provided arguments are not valid
<code>RSMI_STATUS_PERMISSION</code>	function requires root access

#### 5.14.2.4 `rsmi_status_t rsmi_counter_control ( rsmi_event_handle_t evt_handle, rsmi_counter_command_t cmd, void * cmd_args )`

Issue performance counter control commands.

Issue a command `cmd` on the event counter associated with the provided handle `evt_handle`.

#### Parameters

in	<i>evt_handle</i>	an event handle
in	<i>cmd</i>	The event counter command to be issued
in, out	<i>cmd_args</i>	Currently not used. Should be set to NULL.

#### Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_PERMISSION</i></a>	function requires root access

#### 5.14.2.5 `rsmi_status_t rsmi_counter_read ( rsmi_event_handle_t evt_handle, rsmi_counter_value_t * value )`

Read the current value of a performance counter.

Read the current counter value of the counter associated with the provided handle `evt_handle` and write the value to the location pointed to by `value`.

#### Parameters

in	<i>evt_handle</i>	an event handle
in, out	<i>value</i>	pointer to memory of size of <a href="#"><i>rsmi_counter_value_t</i></a> to which the counter value will be written

#### Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call
<a href="#"><i>RSMI_STATUS_INVALID_ARGS</i></a>	the provided arguments are not valid
<a href="#"><i>RSMI_STATUS_PERMISSION</i></a>	function requires root access

#### 5.14.2.6 `rsmi_status_t rsmi_counter_available_counters_get ( uint32_t dv_ind, rsmi_event_group_t grp, uint32_t * available )`

Get the number of currently available counters.

Given a device index `dv_ind`, a performance event group `grp`, and a pointer to a `uint32_t` `available`, this function will write the number of `grp` type counters that are available on the device with index `dv_ind` to the memory that `available` points to.

#### Parameters

in	<i>dv_ind</i>	a device index
in	<i>grp</i>	an event device group
in, out	<i>available</i>	A pointer to a <code>uint32_t</code> to which the number of available counters will be written

## Return values

<i><a href="#">RSMI_STATUS_SUCCESS</a></i>	is returned upon successful call
<i><a href="#">RSMI_STATUS_INVALID_ARGS</a></i>	the provided arguments are not valid



## 5.15 System Information Functions

### Functions

- [rsmi\\_status\\_t rsmi\\_compute\\_process\\_info\\_get](#) ([rsmi\\_process\\_info\\_t](#) \*procs, [uint32\\_t](#) \*num\_items)  
*Get process information about processes currently using GPU.*
- [rsmi\\_status\\_t rsmi\\_compute\\_process\\_info\\_by\\_pid\\_get](#) ([uint32\\_t](#) pid, [rsmi\\_process\\_info\\_t](#) \*proc)  
*Get process information about a specific process.*

### 5.15.1 Detailed Description

These functions are used to configure, query and control performance counting.

### 5.15.2 Function Documentation

#### 5.15.2.1 [rsmi\\_status\\_t rsmi\\_compute\\_process\\_info\\_get](#) ( [rsmi\\_process\\_info\\_t](#) \*procs, [uint32\\_t](#) \* num\_items )

Get process information about processes currently using GPU.

Given a non-NULL pointer to an array `procs` of [rsmi\\_process\\_info\\_t](#)'s, of length `*num_items`, this function will write up to `*num_items` instances of [rsmi\\_process\\_info\\_t](#) to the memory pointed to by `procs`. These instances contain information about each process utilizing a GPU. If `procs` is not NULL, `num_items` will be updated with the number of processes actually written. If `procs` is NULL, `num_items` will be updated with the number of processes for which there is current process information. Calling this function with `procs` being NULL is a way to determine how much memory should be allocated for when `procs` is not NULL.

#### Parameters

in, out	<code>procs</code>	a pointer to memory provided by the caller to which process information will be written. This may be NULL in which case only <code>num_items</code> will be updated with the number of processes found.
in, out	<code>num_items</code>	A pointer to a <a href="#">uint32_t</a> , which on input, should contain the amount of memory in <a href="#">rsmi_process_info_t</a> 's which have been provided by the <code>procs</code> argument. On output, if <code>procs</code> is non-NULL, this will be updated with the number <a href="#">rsmi_process_info_t</a> structs actually written. If <code>procs</code> is NULL, this argument will be updated with the number processes for which there is information.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	is returned upon successful call
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid
<a href="#">RSMI_STATUS_INSUFFICIENT_SIZE</a>	is returned if there were more processes for which information was available, but not enough space was provided as indicated by <code>procs</code> and <code>num_items</code> , on input.

#### 5.15.2.2 [rsmi\\_status\\_t rsmi\\_compute\\_process\\_info\\_by\\_pid\\_get](#) ( [uint32\\_t](#) pid, [rsmi\\_process\\_info\\_t](#) \* proc )

Get process information about a specific process.

Given a pointer to an [rsmi\\_process\\_info\\_t](#) `proc` and a process id `pid`, this function will write the process information for `pid`, if available, to the memory pointed to by `proc`.

**Parameters**

in	<i>pid</i>	The process ID for which process information is being requested
in, out	<i>proc</i>	a pointer to a <a href="#">rsmi_process_info_t</a> to which process information for <code>pid</code> will be written if it is found.

**Return values**

<a href="#">RSMI_STATUS_SUCCESS</a>	is returned upon successful call
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid
<a href="#">RSMI_STATUS_NOT_FOUND</a>	is returned if there was no process information found for the provided <code>pid</code>

## 5.16 XGMI Functions

### Functions

- [rsmi\\_status\\_t rsmi\\_dev\\_xgmi\\_error\\_status](#) (uint32\_t dv\_ind, [rsmi\\_xgmi\\_status\\_t](#) \*status)  
*Retrieve the XGMI error status for a device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_xgmi\\_error\\_reset](#) (uint32\_t dv\_ind)  
*Reset the XGMI error status for a device.*

### 5.16.1 Detailed Description

These functions are used to configure, query and control XGMI.

### 5.16.2 Function Documentation

#### 5.16.2.1 [rsmi\\_status\\_t rsmi\\_dev\\_xgmi\\_error\\_status](#) ( uint32\_t *dv\_ind*, [rsmi\\_xgmi\\_status\\_t](#) \* *status* )

Retrieve the XGMI error status for a device.

Given a device index *dv\_ind*, and a pointer to an [rsmi\\_xgmi\\_status\\_t](#) *status*, this function will write the current XGMI error state [rsmi\\_xgmi\\_status\\_t](#) for the device *dv\_ind* to the memory pointed to by *status*.

#### Parameters

in	<i>dv_ind</i>	a device index
in, out	<i>status</i>	A pointer to an <a href="#">rsmi_xgmi_status_t</a> to which the XGMI error state should be written If this parameter is nullptr, this function will return <a href="#">RSMI_STATUS_INVALID_ARGS</a> if the function is supported with the provided, arguments and <a href="#">RSMI_STATUS_NOT_SUPPORTED</a> if it is not supported with the provided arguments.

#### Return values

<a href="#">RSMI_STATUS_SUCCESS</a>	call was successful
<a href="#">RSMI_STATUS_NOT_SUPPORTED</a>	installed software or hardware does not support this function with the given arguments
<a href="#">RSMI_STATUS_INVALID_ARGS</a>	the provided arguments are not valid

#### 5.16.2.2 [rsmi\\_status\\_t rsmi\\_dev\\_xgmi\\_error\\_reset](#) ( uint32\_t *dv\_ind* )

Reset the XGMI error status for a device.

Given a device index *dv\_ind*, this function will reset the current XGMI error state [rsmi\\_xgmi\\_status\\_t](#) for the device *dv\_ind* to [rsmi\\_xgmi\\_status\\_t::RSMI\\_XGMI\\_STATUS\\_NO\\_ERRORS](#)

#### Parameters

in	<i>dv_ind</i>	a device index
----	---------------	----------------

**Return values**

<i>RSMI_STATUS_SUCCESS</i>	is returned upon successful call.
----------------------------	-----------------------------------

## 5.17 Supported Functions

### Functions

- `rsmi_status_t rsmi_dev_supported_func_iterator_open (uint32_t dv_ind, rsmi_func_id_iter_handle_t *handle)`  
*Get a function name iterator of supported RSMI functions for a device.*
- `rsmi_status_t rsmi_dev_supported_variant_iterator_open (rsmi_func_id_iter_handle_t obj_h, rsmi_func_id_iter_handle_t *var_iter)`  
*Get a variant iterator for a given handle.*
- `rsmi_status_t rsmi_func_iter_next (rsmi_func_id_iter_handle_t handle)`  
*Advance a function identifier iterator.*
- `rsmi_status_t rsmi_dev_supported_func_iterator_close (rsmi_func_id_iter_handle_t *handle)`  
*Close a variant iterator handle.*
- `rsmi_status_t rsmi_func_iter_value_get (rsmi_func_id_iter_handle_t handle, rsmi_func_id_value_t *value)`  
*Get the value associated with a function/variant iterator.*

#### 5.17.1 Detailed Description

API function support varies by both GPU type and the version of the installed ROCm stack. The functions described in this section can be used to determine, up front, which functions are supported for a given device on a system. If such "up front" knowledge of support for a function is not needed, alternatively, one can call a device related function and check the return code.

Some functions have several variations ("variants") where some variants are supported and others are not. For example, on a given device, `rsmi_dev_temp_metric_get` may support some types of temperature metrics (e.g., `RSMI_TEMP_CRITICAL_HYST`), but not others (e.g., `RSMI_TEMP_EMERGENCY`).

In addition to a top level of variant support for a function, a function may have varying support for monitors/sensors. These are considered "sub-variants" in functions described in this section. Continuing the `rsmi_dev_temp_metric_get` example, if variant `RSMI_TEMP_CRITICAL_HYST` is supported, perhaps only the sub-variant sensors `RSMI_TEMP_TYPE_EDGE` and `RSMI_TEMP_TYPE_EDGE` are supported, but not `RSMI_TEMP_TYPE_MEMORY`.

In cases where a function takes in a sensor id parameter but does not have any "top level" variants, the functions in this section will indicate a default "variant", `RSMI_DEFAULT_VARIANT`, for the top level variant, and the various monitor support will be sub-variants of this.

The functions in this section use the "iterator" concept to list which functions are supported; to list which variants of the supported functions are supported; and finally which monitors/sensors are supported for a variant.

Here is example code that prints out all supported functions, their supported variants and sub-variants. Please see the related descriptions functions and RSMI types.

```

rsmi_func_id_iter_handle_t iter_handle, var_iter, sub_var_iter;
rsmi_func_id_value_t value;
rsmi_status_t err;

for (uint32_t i = 0; i < <number of devices>; ++i) {
    std::cout << "Supported RSMI Functions:" << std::endl;
    std::cout << "\tVariants (Monitors)" << std::endl;

    err = rsmi_dev_supported_func_iterator_open(i, &iter_handle);

    while (1) {
        err = rsmi_func_iter_value_get(iter_handle, &value);
        std::cout << "Function Name: " << value.name << std::endl;

        err = rsmi_dev_supported_variant_iterator_open(iter_handle, &
            var_iter);
        if (err != RSMI_STATUS_NO_DATA) {
            std::cout << "\tVariants/Monitors: ";
            while (1) {
                err = rsmi_func_iter_value_get(var_iter, &value);
                if (value.id == RSMI_DEFAULT_VARIANT) {
                    std::cout << "Default Variant ";
                } else {
                    std::cout << value.id;
                }
                std::cout << " ";

                err =
                    rsmi_dev_supported_variant_iterator_open(var_iter, &
                        sub_var_iter);
                if (err != RSMI_STATUS_NO_DATA) {
                    while (1) {
                        err = rsmi_func_iter_value_get(sub_var_iter, &value);
                        std::cout << value.id << ", ";

                        err = rsmi_func_iter_next(sub_var_iter);

                        if (err == RSMI_STATUS_NO_DATA) {
                            break;
                        }
                    }
                    err = rsmi_dev_supported_func_iterator_close(&sub_var_iter)
                ;
            }

            std::cout << " ", " ";

            err = rsmi_func_iter_next(var_iter);

            if (err == RSMI_STATUS_NO_DATA) {
                break;
            }
        }
        std::cout << std::endl;

        err = rsmi_dev_supported_func_iterator_close(&var_iter);
    }

    err = rsmi_func_iter_next(iter_handle);

    if (err == RSMI_STATUS_NO_DATA) {
        break;
    }
}
err = rsmi_dev_supported_func_iterator_close(&iter_handle);
}

```

## 5.17.2 Function Documentation

### 5.17.2.1 rsmi\_status\_t rsmi\_dev\_supported\_func\_iterator\_open ( uint32\_t dv\_ind, rsmi\_func\_id\_iter\_handle\_t \* handle )

Get a function name iterator of supported RSMI functions for a device.

Given a device index `dv_ind`, this function will write a function iterator handle to the caller-provided memory pointed to by `handle`. This handle can be used to iterate through all the supported functions.

Note that although this function takes in `dv_ind` as an argument, [rsmi\\_dev\\_supported\\_func\\_iterator\\_open](#) itself will not be among the functions listed as supported. This is because [rsmi\\_dev\\_supported\\_func\\_iterator\\_open](#) does not depend on hardware or driver support and should always be supported.

## Parameters

in	<i>dv_ind</i>	a device index of device for which support information is requested
in, out	<i>handle</i>	A pointer to caller-provided memory to which the function iterator will be written.

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
--	-----------------------------------

### 5.17.2.2 `rsmi_status_t rsmi_dev_supported_variant_iterator_open ( rsmi_func_id_iter_handle_t obj_h, rsmi_func_id_iter_handle_t * var_iter )`

Get a variant iterator for a given handle.

Given a [`rsmi\_func\_id\_iter\_handle\_t`](#) `obj_h`, this function will write a function iterator handle to the caller-provided memory pointed to by `var_iter`. This handle can be used to iterate through all the supported variants of the provided handle. `obj_h` may be a handle to a function object, as provided by a call to [`rsmi\_dev\_supported\_func\_iterator\_open`](#), or it may be a variant itself (from a call to [`rsmi\_dev\_supported\_variant\_iterator\_open`](#)), in which case `var_iter` will be an iterator of the sub-variants of `obj_h` (e.g., monitors).

This call allocates a small amount of memory to `var_iter`. To free this memory [`rsmi\_dev\_supported\_func\_iterator\_close`](#) should be called on the returned iterator handle `var_iter` when it is no longer needed.

## Parameters

in	<i>obj_h</i>	an iterator handle for which the variants are being requested
in, out	<i>var_iter</i>	A pointer to caller-provided memory to which the sub-variant iterator will be written.

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
--	-----------------------------------

### 5.17.2.3 `rsmi_status_t rsmi_func_iter_next ( rsmi_func_id_iter_handle_t handle )`

Advance a function identifier iterator.

Given a function id iterator handle ([`rsmi\_func\_id\_iter\_handle\_t`](#)) `handle`, this function will increment the iterator to point to the next identifier. After a successful call to this function, obtaining the value of the iterator `handle` will provide the value of the next item in the list of functions/variants.

If there are no more items in the list, [`RSMI\_STATUS\_NO\_DATA`](#) is returned.

## Parameters

in	<i>handle</i>	A pointer to an iterator handle to be incremented
----	---------------	---



## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
<a href="#"><i>RSMI_STATUS_NO_DATA</i></a>	is returned when list of identifiers has been exhausted

5.17.2.4 `rsmi_status_t rsmi_dev_supported_func_iterator_close ( rsmi_func_id_iter_handle_t * handle )`

Close a variant iterator handle.

Given a pointer to an [`rsmi\_func\_id\_iter\_handle\_t`](#) handle, this function will free the resources being used by the handle

## Parameters

in	<i>handle</i>	A pointer to an iterator handle to be closed
----	---------------	--

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
--	-----------------------------------

5.17.2.5 `rsmi_status_t rsmi_func_iter_value_get ( rsmi_func_id_iter_handle_t handle, rsmi_func_id_value_t * value )`

Get the value associated with a function/variant iterator.

Given an [`rsmi\_func\_id\_iter\_handle\_t`](#) handle, this function will write the identifier of the function/variant to the user provided memory pointed to by *value*.

*value* may point to a function name, a variant id, or a monitor/sensor index, depending on what kind of iterator handle is

## Parameters

in	<i>handle</i>	An iterator for which the value is being requested
in, out	<i>value</i>	A pointer to an <a href="#"><code>rsmi_func_id_value_t</code></a> provided by the caller to which this function will write the value associated with <i>handle</i>

## Return values

<a href="#"><i>RSMI_STATUS_SUCCESS</i></a>	is returned upon successful call.
--	-----------------------------------



## Chapter 6

# Data Structure Documentation

### 6.1 id Union Reference

This union holds the value of an [rsmi\\_func\\_id\\_iter\\_handle\\_t](#). The value may be a function name, or an enumerated variant value of types such as [rsmi\\_memory\\_type\\_t](#), [rsmi\\_temperature\\_metric\\_t](#), etc.

```
#include <rocm_smi.h>
```

#### Data Fields

- [uint64\\_t id](#)  
*uint64\_t representation of value*
- `const char * name`  
*name string (applicable to functions only)*
- `union {`
  - [rsmi\\_memory\\_type\\_t memory\\_type](#)  
*< Used for [rsmi\\_memory\\_type\\_t](#) variants*
  - [rsmi\\_temperature\\_metric\\_t temp\\_metric](#)  
*Used for [rsmi\\_event\\_type\\_t](#) variants.*
  - [rsmi\\_event\\_type\\_t evnt\\_type](#)  
*Used for [rsmi\\_event\\_group\\_t](#) variants.*
  - [rsmi\\_event\\_group\\_t evnt\\_group](#)  
*Used for [rsmi\\_clk\\_type\\_t](#) variants.*
  - [rsmi\\_clk\\_type\\_t clk\\_type](#)  
*Used for [rsmi\\_fw\\_block\\_t](#) variants.*
  - [rsmi\\_fw\\_block\\_t fw\\_block](#)  
*Used for [rsmi\\_gpu\\_block\\_t](#) variants.*
  - [rsmi\\_gpu\\_block\\_t gpu\\_block\\_type](#)`};`

#### 6.1.1 Detailed Description

This union holds the value of an [rsmi\\_func\\_id\\_iter\\_handle\\_t](#). The value may be a function name, or an enumerated variant value of types such as [rsmi\\_memory\\_type\\_t](#), [rsmi\\_temperature\\_metric\\_t](#), etc.

## 6.1.2 Field Documentation

### 6.1.2.1 `rsmi_memory_type_t` id::memory\_type

< Used for [rsmi\\_memory\\_type\\_t](#) variants

Used for [rsmi\\_temperature\\_metric\\_t](#) variants

The documentation for this union was generated from the following file:

- [rocm\\_smi.h](#)

## 6.2 `rsmi_counter_value_t` Struct Reference

```
#include <rocm_smi.h>
```

### Data Fields

- `uint64_t` [value](#)  
*Counter value.*
- `uint64_t` [time\\_enabled](#)  
*Time that the counter was enabled.*
- `uint64_t` [time\\_running](#)  
*Time that the counter was running.*

### 6.2.1 Detailed Description

Counter value

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.3 `rsmi_error_count_t` Struct Reference

This structure holds error counts.

```
#include <rocm_smi.h>
```

### Data Fields

- `uint64_t` [correctable\\_err](#)  
*Accumulated correctable errors.*
- `uint64_t` [uncorrectable\\_err](#)  
*Accumulated uncorrectable errors.*

### 6.3.1 Detailed Description

This structure holds error counts.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.4 rsmi\_freq\_volt\_region\_t Struct Reference

This structure holds 2 [rsmi\\_range\\_t](#)'s, one for frequency and one for voltage. These 2 ranges indicate the range of possible values for the corresponding [rsmi\\_od\\_vddc\\_point\\_t](#).

```
#include <rocm_smi.h>
```

### Data Fields

- [rsmi\\_range\\_t freq\\_range](#)  
*The frequency range for this VDDC Curve point.*
- [rsmi\\_range\\_t volt\\_range](#)  
*The voltage range for this VDDC Curve point.*

### 6.4.1 Detailed Description

This structure holds 2 [rsmi\\_range\\_t](#)'s, one for frequency and one for voltage. These 2 ranges indicate the range of possible values for the corresponding [rsmi\\_od\\_vddc\\_point\\_t](#).

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.5 rsmi\_frequencies\_t Struct Reference

This structure holds information about clock frequencies.

```
#include <rocm_smi.h>
```

### Data Fields

- uint32\_t [num\\_supported](#)
- uint32\_t [current](#)
- uint64\_t [frequency](#) [[RSMI\\_MAX\\_NUM\\_FREQUENCIES](#)]

### 6.5.1 Detailed Description

This structure holds information about clock frequencies.

### 6.5.2 Field Documentation

#### 6.5.2.1 `uint32_t rsmi_frequencies_t::num_supported`

The number of supported frequencies

#### 6.5.2.2 `uint32_t rsmi_frequencies_t::current`

The current frequency index

#### 6.5.2.3 `uint64_t rsmi_frequencies_t::frequency[RSMI_MAX_NUM_FREQUENCIES]`

List of frequencies. Only the first `num_supported` frequencies are valid.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.6 `rsmi_od_vddc_point_t` Struct Reference

This structure represents a point on the frequency-voltage plane.

```
#include <rocm_smi.h>
```

### Data Fields

- `uint64_t frequency`  
*Frequency coordinate (in Hz)*
- `uint64_t voltage`  
*Voltage coordinate (in mV)*

### 6.6.1 Detailed Description

This structure represents a point on the frequency-voltage plane.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.7 rsmi\_od\_volt\_curve\_t Struct Reference

```
#include <rocm_smi.h>
```

### Data Fields

- [rsmi\\_od\\_vddc\\_point\\_t vc\\_points](#) [RSMI\_NUM\_VOLTAGE\_CURVE\_POINTS]

### 6.7.1 Detailed Description

[RSMI\\_NUM\\_VOLTAGE\\_CURVE\\_POINTS](#) number of [rsmi\\_od\\_vddc\\_point\\_t](#)'s

### 6.7.2 Field Documentation

#### 6.7.2.1 [rsmi\\_od\\_vddc\\_point\\_t rsmi\\_od\\_volt\\_curve\\_t::vc\\_points](#)[RSMI\_NUM\_VOLTAGE\_CURVE\_POINTS]

Array of [RSMI\\_NUM\\_VOLTAGE\\_CURVE\\_POINTS](#) [rsmi\\_od\\_vddc\\_point\\_t](#)'s that make up the voltage frequency curve points.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.8 rsmi\_od\_volt\_freq\_data\_t Struct Reference

This structure holds the frequency-voltage values for a device.

```
#include <rocm_smi.h>
```

### Data Fields

- [rsmi\\_range\\_t curr\\_sclk\\_range](#)  
*The current SCLK frequency range.*
- [rsmi\\_range\\_t curr\\_mclk\\_range](#)
- [rsmi\\_range\\_t sclk\\_freq\\_limits](#)  
*The range possible of SCLK values.*
- [rsmi\\_range\\_t mclk\\_freq\\_limits](#)  
*The range possible of MCLK values.*
- [rsmi\\_od\\_volt\\_curve\\_t curve](#)  
*The current voltage curve.*
- [uint32\\_t num\\_regions](#)  
*The number of voltage curve regions.*

### 6.8.1 Detailed Description

This structure holds the frequency-voltage values for a device.

### 6.8.2 Field Documentation

#### 6.8.2.1 `rsmi_range_t rsmi_od_volt_freq_data_t::curr_mclk_range`

The current MCLK frequency range; (upper bound only)

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.9 `rsmi_pcie_bandwidth_t` Struct Reference

This structure holds information about the possible PCIe bandwidths. Specifically, the possible transfer rates and their associated numbers of lanes are stored here.

```
#include <rocm_smi.h>
```

### Data Fields

- [rsmi\\_frequencies\\_t transfer\\_rate](#)
- `uint32_t lanes` [[RSMI\\_MAX\\_NUM\\_FREQUENCIES](#)]

### 6.9.1 Detailed Description

This structure holds information about the possible PCIe bandwidths. Specifically, the possible transfer rates and their associated numbers of lanes are stored here.

### 6.9.2 Field Documentation

#### 6.9.2.1 `rsmi_frequencies_t rsmi_pcie_bandwidth_t::transfer_rate`

Transfer rates (T/s) that are possible

#### 6.9.2.2 `uint32_t rsmi_pcie_bandwidth_t::lanes[RSMI_MAX_NUM_FREQUENCIES]`

List of lanes for corresponding transfer rate. Only the first num\_supported bandwidths are valid.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)



## 6.10 rsmi\_power\_profile\_status\_t Struct Reference

This structure contains information about which power profiles are supported by the system for a given device, and which power profile is currently active.

```
#include <rocm_smi.h>
```

### Data Fields

- [rsmi\\_bit\\_field\\_t available\\_profiles](#)
- [rsmi\\_power\\_profile\\_preset\\_masks\\_t current](#)
- [uint32\\_t num\\_profiles](#)

### 6.10.1 Detailed Description

This structure contains information about which power profiles are supported by the system for a given device, and which power profile is currently active.

### 6.10.2 Field Documentation

#### 6.10.2.1 [rsmi\\_bit\\_field\\_t rsmi\\_power\\_profile\\_status\\_t::available\\_profiles](#)

Which profiles are supported by this system

#### 6.10.2.2 [rsmi\\_power\\_profile\\_preset\\_masks\\_t rsmi\\_power\\_profile\\_status\\_t::current](#)

Which power profile is currently active

#### 6.10.2.3 [uint32\\_t rsmi\\_power\\_profile\\_status\\_t::num\\_profiles](#)

How many power profiles are available

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.11 rsmi\_process\_info\_t Struct Reference

This structure contains information specific to a process.

```
#include <rocm_smi.h>
```

## Data Fields

- uint32\_t [process\\_id](#)  
*Process ID.*
- uint32\_t [pasid](#)  
*PASID.*

### 6.11.1 Detailed Description

This structure contains information specific to a process.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.12 rsmi\_range\_t Struct Reference

This structure represents a range (e.g., frequencies or voltages).

```
#include <rocm_smi.h>
```

## Data Fields

- uint64\_t [lower\\_bound](#)  
*Lower bound of range.*
- uint64\_t [upper\\_bound](#)  
*Upper bound of range.*

### 6.12.1 Detailed Description

This structure represents a range (e.g., frequencies or voltages).

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.13 rsmi\_retired\_page\_record\_t Struct Reference

Reserved Memory Page Record.

```
#include <rocm_smi.h>
```

## Data Fields

- uint64\_t [page\\_address](#)  
*Start address of page.*
- uint64\_t [page\\_size](#)  
*Page size.*
- [rsmi\\_memory\\_page\\_status\\_t](#) [status](#)  
*Page "reserved" status.*

### 6.13.1 Detailed Description

Reserved Memory Page Record.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)

## 6.14 rsmi\_version\_t Struct Reference

This structure holds version information.

```
#include <rocm_smi.h>
```

## Data Fields

- uint32\_t [major](#)  
*Major version.*
- uint32\_t [minor](#)  
*Minor version.*
- uint32\_t [patch](#)  
*Patch, build or stepping version.*
- const char \* [build](#)  
*Build string.*

### 6.14.1 Detailed Description

This structure holds version information.

The documentation for this struct was generated from the following file:

- [rocm\\_smi.h](#)



# Chapter 7

## File Documentation

### 7.1 rocm\_smi.h File Reference

The rocm\_smi library api is new, and therefore subject to change either at the ABI or API level. Instead of marking every function prototype as "unstable", we are instead saying the API is unstable (i.e., changes are possible) while the major version remains 0. This means that if the API/ABI changes, we will not increment the major version to 1. Once the ABI stabilizes, we will increment the major version to 1, and thereafter increment it on all ABI breaks.

```
#include <stdint.h>
#include <stddef.h>
```

#### Data Structures

- struct [rsmi\\_counter\\_value\\_t](#)
- struct [rsmi\\_retired\\_page\\_record\\_t](#)  
*Reserved Memory Page Record.*
- struct [rsmi\\_power\\_profile\\_status\\_t](#)  
*This structure contains information about which power profiles are supported by the system for a given device, and which power profile is currently active.*
- struct [rsmi\\_frequencies\\_t](#)  
*This structure holds information about clock frequencies.*
- struct [rsmi\\_pcie\\_bandwidth\\_t](#)  
*This structure holds information about the possible PCIe bandwidths. Specifically, the possible transfer rates and their associated numbers of lanes are stored here.*
- struct [rsmi\\_version\\_t](#)  
*This structure holds version information.*
- struct [rsmi\\_range\\_t](#)  
*This structure represents a range (e.g., frequencies or voltages).*
- struct [rsmi\\_od\\_vddc\\_point\\_t](#)  
*This structure represents a point on the frequency-voltage plane.*
- struct [rsmi\\_freq\\_volt\\_region\\_t](#)  
*This structure holds 2 [rsmi\\_range\\_t](#)'s, one for frequency and one for voltage. These 2 ranges indicate the range of possible values for the corresponding [rsmi\\_od\\_vddc\\_point\\_t](#).*
- struct [rsmi\\_od\\_volt\\_curve\\_t](#)
- struct [rsmi\\_od\\_volt\\_freq\\_data\\_t](#)

*This structure holds the frequency-voltage values for a device.*

- struct [rsmi\\_error\\_count\\_t](#)

*This structure holds error counts.*

- struct [rsmi\\_process\\_info\\_t](#)

*This structure contains information specific to a process.*

- union [id](#)

*This union holds the value of an [rsmi\\_func\\_id\\_iter\\_handle\\_t](#). The value may be a function name, or an enumerated variant value of types such as [rsmi\\_memory\\_type\\_t](#), [rsmi\\_temperature\\_metric\\_t](#), etc.*

## Macros

- #define [RSMI\\_MAX\\_NUM\\_FREQUENCIES](#) 32

*Guaranteed maximum possible number of supported frequencies.*

- #define [RSMI\\_MAX\\_FAN\\_SPEED](#) 255

- #define [RSMI\\_NUM\\_VOLTAGE\\_CURVE\\_POINTS](#) 3

*The number of points that make up a voltage-frequency curve definition.*

- #define [RSMI\\_MAX\\_NUM\\_POWER\\_PROFILES](#) (sizeof([rsmi\\_bit\\_field\\_t](#)) \* 8)

*Number of possible power profiles that a system could support.*

- #define [RSMI\\_DEFAULT\\_VARIANT](#) 0xFFFFFFFFFFFFFFFF

## Typedefs

- typedef uintptr\_t [rsmi\\_event\\_handle\\_t](#)

*Handle to performance event counter.*

- typedef uint64\_t [rsmi\\_bit\\_field\\_t](#)

*Bitfield used in various RSMI calls.*

- typedef struct rsmi\_func\_id\_iter\_handle \* [rsmi\\_func\\_id\\_iter\\_handle\\_t](#)

*Opaque handle to function-support object.*

- typedef union [id](#) [rsmi\\_func\\_id\\_value\\_t](#)

*This union holds the value of an [rsmi\\_func\\_id\\_iter\\_handle\\_t](#). The value may be a function name, or an enumerated variant value of types such as [rsmi\\_memory\\_type\\_t](#), [rsmi\\_temperature\\_metric\\_t](#), etc.*

## Enumerations

- enum [rsmi\\_status\\_t](#) {  
[RSMI\\_STATUS\\_SUCCESS](#) = 0x0, [RSMI\\_STATUS\\_INVALID\\_ARGS](#), [RSMI\\_STATUS\\_NOT\\_SUPPORTED](#),  
[RSMI\\_STATUS\\_FILE\\_ERROR](#),  
[RSMI\\_STATUS\\_PERMISSION](#), [RSMI\\_STATUS\\_OUT\\_OF\\_RESOURCES](#), [RSMI\\_STATUS\\_INTERNAL\\_↵](#)  
[EXCEPTION](#), [RSMI\\_STATUS\\_INPUT\\_OUT\\_OF\\_BOUNDS](#),  
[RSMI\\_STATUS\\_INIT\\_ERROR](#), **[RSMI\\_INITIALIZATION\\_ERROR](#)** = [RSMI\\_STATUS\\_INIT\\_ERROR](#), [RSMI\\_↵](#)  
[\\_STATUS\\_NOT\\_YET\\_IMPLEMENTED](#), [RSMI\\_STATUS\\_NOT\\_FOUND](#),  
[RSMI\\_STATUS\\_INSUFFICIENT\\_SIZE](#), [RSMI\\_STATUS\\_INTERRUPT](#), [RSMI\\_STATUS\\_UNEXPECTED\\_↵](#)  
[SIZE](#), [RSMI\\_STATUS\\_NO\\_DATA](#),  
[RSMI\\_STATUS\\_UNKNOWN\\_ERROR](#) = 0xFFFFFFFF }

*Error codes returned by [rocm\\_smi\\_lib](#) functions.*

- enum [rsmi\\_init\\_flags\\_t](#) { [RSMI\\_INIT\\_FLAG\\_ALL\\_GPU](#) = 0x1 }

*Initialization flags.*

- enum `rsmi_dev_perf_level_t` {  
`RSMI_DEV_PERF_LEVEL_AUTO` = 0, `RSMI_DEV_PERF_LEVEL_FIRST` = `RSMI_DEV_PERF_LEVEL_AUTO`, `RSMI_DEV_PERF_LEVEL_LOW`, `RSMI_DEV_PERF_LEVEL_HIGH`,  
`RSMI_DEV_PERF_LEVEL_MANUAL`, `RSMI_DEV_PERF_LEVEL_STABLE_STD`, `RSMI_DEV_PERF_LEVEL_STABLE_PEAK`, `RSMI_DEV_PERF_LEVEL_STABLE_MIN_MCLK`,  
`RSMI_DEV_PERF_LEVEL_STABLE_MIN_SCLK`, `RSMI_DEV_PERF_LEVEL_LAST` = `RSMI_DEV_PERF_LEVEL_STABLE_MIN_SCLK`, `RSMI_DEV_PERF_LEVEL_UNKNOWN` = 0x100 }  
*PowerPlay performance levels.*
- enum `rsmi_sw_component_t` { `RSMI_SW_COMP_FIRST` = 0x0, `RSMI_SW_COMP_DRIVER` = `RSMI_SW_COMP_FIRST`, `RSMI_SW_COMP_LAST` = `RSMI_SW_COMP_DRIVER` }  
*Available clock types.*
- enum `rsmi_event_group_t` { `RSMI_EVNT_GRP_XGMI` = 0, `RSMI_EVNT_GRP_INVALID` = 0xFFFFFFFF }  
*Enum denoting an event group. The value of the enum is the base value for all the event enums in the group.*
- enum `rsmi_event_type_t` {  
`RSMI_EVNT_FIRST` = `RSMI_EVNT_GRP_XGMI`, `RSMI_EVNT_XGMI_FIRST` = `RSMI_EVNT_GRP_XGMI`,  
`RSMI_EVNT_XGMI_0_NOP_TX` = `RSMI_EVNT_XGMI_FIRST`, `RSMI_EVNT_XGMI_0_REQUEST_TX`,  
`RSMI_EVNT_XGMI_0_RESPONSE_TX`, `RSMI_EVNT_XGMI_0_BEATS_TX`, `RSMI_EVNT_XGMI_1_NOP_TX`,  
`RSMI_EVNT_XGMI_1_REQUEST_TX`,  
`RSMI_EVNT_XGMI_1_RESPONSE_TX`, `RSMI_EVNT_XGMI_1_BEATS_TX`, `RSMI_EVNT_XGMI_LAST` =  
`RSMI_EVNT_XGMI_1_BEATS_TX`, `RSMI_EVNT_LAST` = `RSMI_EVNT_XGMI_LAST` }  
*Event type enum. Events belonging to a particular event group `rsmi_event_group_t` should begin enumerating at the `rsmi_event_group_t` value for that group.*
- enum `rsmi_counter_command_t` { `RSMI_CNTR_CMD_START` = 0, `RSMI_CNTR_CMD_STOP` }
- enum `rsmi_clk_type_t` {  
`RSMI_CLK_TYPE_SYS` = 0x0, `RSMI_CLK_TYPE_FIRST` = `RSMI_CLK_TYPE_SYS`, `RSMI_CLK_TYPE_DF`,  
`RSMI_CLK_TYPE_DCEF`,  
`RSMI_CLK_TYPE_SOC`, `RSMI_CLK_TYPE_MEM`, `RSMI_CLK_TYPE_LAST` = `RSMI_CLK_TYPE_MEM`,  
`RSMI_CLK_INVALID` = 0xFFFFFFFF }
- enum `rsmi_temperature_metric_t` {  
`RSMI_TEMP_CURRENT` = 0x0, `RSMI_TEMP_FIRST` = `RSMI_TEMP_CURRENT`, `RSMI_TEMP_MAX`, `RSMI_TEMP_MIN`,  
`RSMI_TEMP_MAX_HYST`, `RSMI_TEMP_MIN_HYST`, `RSMI_TEMP_CRITICAL`, `RSMI_TEMP_CRITICAL_HYST`,  
`RSMI_TEMP_EMERGENCY`, `RSMI_TEMP_EMERGENCY_HYST`, `RSMI_TEMP_CRIT_MIN`, `RSMI_TEMP_CRIT_MIN_HYST`,  
`RSMI_TEMP_OFFSET`, `RSMI_TEMP_LOWEST`, `RSMI_TEMP_HIGHEST`, `RSMI_TEMP_LAST` = `RSMI_TEMP_HIGHEST` }  
*Temperature Metrics. This enum is used to identify various temperature metrics. Corresponding values will be in millidegrees Celsius.*
- enum `rsmi_temperature_type_t` {  
`RSMI_TEMP_TYPE_FIRST` = 0, `RSMI_TEMP_TYPE_EDGE` = `RSMI_TEMP_TYPE_FIRST`, `RSMI_TEMP_TYPE_JUNCTION`, `RSMI_TEMP_TYPE_MEMORY`,  
`RSMI_TEMP_TYPE_LAST` = `RSMI_TEMP_TYPE_MEMORY` }  
*This enumeration is used to indicate from which part of the device a temperature reading should be obtained.*
- enum `rsmi_power_profile_preset_masks_t` {  
`RSMI_PWR_PROF_PRST_CUSTOM_MASK` = 0x1, `RSMI_PWR_PROF_PRST_VIDEO_MASK` = 0x2, `RSMI_PWR_PROF_PRST_POWER_SAVING_MASK` = 0x4, `RSMI_PWR_PROF_PRST_COMPUTE_MASK` = 0x8,  
`RSMI_PWR_PROF_PRST_VR_MASK` = 0x10, `RSMI_PWR_PROF_PRST_3D_FULL_SCR_MASK` = 0x20,  
`RSMI_PWR_PROF_PRST_BOOTUP_DEFAULT` = 0x40, `RSMI_PWR_PROF_PRST_LAST` = `RSMI_PWR_PROF_PRST_BOOTUP_DEFAULT`,  
`RSMI_PWR_PROF_PRST_INVALID` = 0xFFFFFFFFFFFFFFFF }  
*Pre-set Profile Selections. These bitmasks can be AND'd with the `rsmi_power_profile_status_t.available_profiles` returned from `rsmi_dev_power_profile_presets_get` to determine which power profiles are supported by the system.*
- enum `rsmi_gpu_block_t` {  
`RSMI_GPU_BLOCK_INVALID` = 0x0000000000000000, `RSMI_GPU_BLOCK_FIRST` = 0x0000000000000001,

```

RSMI_GPU_BLOCK_UMC = RSMI_GPU_BLOCK_FIRST, RSMI_GPU_BLOCK_SDMA = 0x0000000000000002,
RSMI_GPU_BLOCK_GFX = 0x0000000000000004, RSMI_GPU_BLOCK_MMHUB = 0x0000000000000008,
RSMI_GPU_BLOCK_ATHUB = 0x0000000000000010, RSMI_GPU_BLOCK_PCIE_BIF = 0x0000000000000020,
RSMI_GPU_BLOCK_HDP = 0x0000000000000040, RSMI_GPU_BLOCK_XGMI_WAFL = 0x0000000000000080,
RSMI_GPU_BLOCK_DF = 0x0000000000000100, RSMI_GPU_BLOCK_SMN = 0x0000000000000200,
RSMI_GPU_BLOCK_SEM = 0x0000000000000400, RSMI_GPU_BLOCK_MP0 = 0x0000000000000800,
RSMI_GPU_BLOCK_MP1 = 0x0000000000001000, RSMI_GPU_BLOCK_FUSE = 0x0000000000002000,
RSMI_GPU_BLOCK_LAST = RSMI_GPU_BLOCK_FUSE, RSMI_GPU_BLOCK_RESERVED = 0x8000000000000000
}

```

*This enum is used to identify different GPU blocks.*

- enum `rsmi_ras_err_state_t` {  
`RSMI_RAS_ERR_STATE_NONE` = 0, `RSMI_RAS_ERR_STATE_DISABLED`, `RSMI_RAS_ERR_STATE_`  
`_PARITY`, `RSMI_RAS_ERR_STATE_SING_C`,  
`RSMI_RAS_ERR_STATE_MULT_UC`, `RSMI_RAS_ERR_STATE_POISON`, `RSMI_RAS_ERR_STATE_E`  
`_ENABLED`, `RSMI_RAS_ERR_STATE_LAST` = `RSMI_RAS_ERR_STATE_ENABLED`,  
`RSMI_RAS_ERR_STATE_INVALID` = 0xFFFFFFFF }

*The current ECC state.*

- enum `rsmi_memory_type_t` {  
`RSMI_MEM_TYPE_FIRST` = 0, `RSMI_MEM_TYPE_VRAM` = `RSMI_MEM_TYPE_FIRST`, `RSMI_MEM_T`  
`YPE_VIS_VRAM`, `RSMI_MEM_TYPE_GTT`,  
`RSMI_MEM_TYPE_LAST` = `RSMI_MEM_TYPE_GTT` }

*Types of memory.*

- enum `rsmi_freq_ind_t` { `RSMI_FREQ_IND_MIN` = 0, `RSMI_FREQ_IND_MAX` = 1, `RSMI_FREQ_IND_INV`  
`ALID` = 0xFFFFFFFF }

*The values of this enum are used as frequency identifiers.*

- enum `rsmi_fw_block_t` {  
`RSMI_FW_BLOCK_FIRST` = 0, `RSMI_FW_BLOCK_ASD` = `RSMI_FW_BLOCK_FIRST`, `RSMI_FW_BLO`  
`CK_CE`, `RSMI_FW_BLOCK_DMCU`,  
`RSMI_FW_BLOCK_MC`, `RSMI_FW_BLOCK_ME`, `RSMI_FW_BLOCK_MEC`, `RSMI_FW_BLOCK_MEC2`,  
`RSMI_FW_BLOCK_PFP`, `RSMI_FW_BLOCK_RLC`, `RSMI_FW_BLOCK_RLC_SRLC`, `RSMI_FW_BLOC`  
`K_RLC_SRLG`,  
`RSMI_FW_BLOCK_RLC_SRLS`, `RSMI_FW_BLOCK_SDMA`, `RSMI_FW_BLOCK_SDMA2`, `RSMI_FW_`  
`BLOCK_SMC`,  
`RSMI_FW_BLOCK_SOS`, `RSMI_FW_BLOCK_TA_RAS`, `RSMI_FW_BLOCK_TA_XGMI`, `RSMI_FW_BL`  
`OCK_UVD`,  
`RSMI_FW_BLOCK_VCE`, `RSMI_FW_BLOCK_VCN`, `RSMI_FW_BLOCK_LAST` = `RSMI_FW_BLOCK_V`  
`CN` }

*The values of this enum are used to identify the various firmware blocks.*

- enum `rsmi_xgmi_status_t` { `RSMI_XGMI_STATUS_NO_ERRORS` = 0, `RSMI_XGMI_STATUS_ERROR`, `R`  
`SMI_XGMI_STATUS_MULTIPLE_ERRORS` }

*XGMI Status.*

- enum `rsmi_memory_page_status_t` { `RSMI_MEM_PAGE_STATUS_RESERVED` = 0, `RSMI_MEM_PAGE`  
`_STATUS_PENDING`, `RSMI_MEM_PAGE_STATUS_UNRESERVABLE` }

*Reserved Memory Page States.*

## Functions

- `rsmi_status_t rsmi_init` (uint64\_t init\_flags)  
*Initialize ROCm SMI.*
- `rsmi_status_t rsmi_shut_down` (void)  
*Shutdown ROCm SMI.*
- `rsmi_status_t rsmi_num_monitor_devices` (uint32\_t \*num\_devices)  
*Get the number of devices that have monitor information.*
- `rsmi_status_t rsmi_dev_id_get` (uint32\_t dv\_ind, uint16\_t \*id)



- Get the device id associated with the device with provided device index.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_vendor\\_id\\_get](#) (uint32\_t dv\_ind, uint16\_t \*id)
- Get the device vendor id associated with the device with provided device index.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_name\\_get](#) (uint32\_t dv\_ind, char \*name, size\_t len)
- Get the name string of a gpu device.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_brand\\_get](#) (uint32\_t dv\_ind, char \*brand, uint32\_t len)
- Get the brand string of a gpu device.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_vendor\\_name\\_get](#) (uint32\_t dv\_ind, char \*name, size\_t len)
- Get the name string for a give vendor ID.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_vram\\_vendor\\_get](#) (uint32\_t dv\_ind, char \*brand, uint32\_t len)
- Get the vram vendor string of a gpu device.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_serial\\_number\\_get](#) (uint32\_t dv\_ind, char \*serial\_num, uint32\_t len)
- Get the serial number string for a device.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_subsystem\\_id\\_get](#) (uint32\_t dv\_ind, uint16\_t \*id)
- Get the subsystem device id associated with the device with provided device index.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_subsystem\\_name\\_get](#) (uint32\_t dv\_ind, char \*name, size\_t len)
- Get the name string for the device subsytem.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_drm\\_render\\_minor\\_get](#) (uint32\_t dv\_ind, uint32\_t \*minor)
- Get the drm minor number associated with this device.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_subsystem\\_vendor\\_id\\_get](#) (uint32\_t dv\_ind, uint16\_t \*id)
- Get the device subsystem vendor id associated with the device with provided device index.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_unique\\_id\\_get](#) (uint32\_t dv\_ind, uint64\_t \*id)
- Get Unique ID.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_bandwidth\\_get](#) (uint32\_t dv\_ind, [rsmi\\_pcie\\_bandwidth\\_t](#) \*bandwidth)
- Get the list of possible PCIe bandwidths that are available.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_id\\_get](#) (uint32\_t dv\_ind, uint64\_t \*bdfid)
- Get the unique PCI device identifier associated for a device.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_throughput\\_get](#) (uint32\_t dv\_ind, uint64\_t \*sent, uint64\_t \*received, uint64\_t \*max\_pkt\_sz)
- Get PCIe traffic information.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_replay\\_counter\\_get](#) (uint32\_t dv\_ind, uint64\_t \*counter)
- Get PCIe replay counter.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_pci\\_bandwidth\\_set](#) (uint32\_t dv\_ind, uint64\_t bw\_bitmask)
- Control the set of allowed PCIe bandwidths that can be used.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_power\\_ave\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*power)
- Get the average power consumption of the device with provided device index.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*cap)
- Get the cap on power which, when reached, causes the system to take action to reduce power.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_range\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*max, uint64\_t \*min)
- Get the range of valid values for the power cap.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_power\\_cap\\_set](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t cap)
- Set the power cap value.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_power\\_profile\\_set](#) (uint32\_t dv\_ind, uint32\_t reserved, [rsmi\\_power\\_profile\\_preset\\_t](#) \*masks, [rsmi\\_power\\_profile\\_t](#) profile)
- Set the power profile.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_memory\\_total\\_get](#) (uint32\_t dv\_ind, [rsmi\\_memory\\_type\\_t](#) mem\_type, uint64\_t \*total)
- Get the total amount of memory that exists.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_memory\\_usage\\_get](#) (uint32\_t dv\_ind, [rsmi\\_memory\\_type\\_t](#) mem\_type, uint64\_t \*used)

- Get the current memory usage.*

  - [rsmi\\_status\\_t rsmi\\_dev\\_memory\\_busy\\_percent\\_get](#) (uint32\_t dv\_ind, uint32\_t \*busy\_percent)

*Get percentage of time any device memory is being used.*
- [rsmi\\_status\\_t rsmi\\_dev\\_memory\\_reserved\\_pages\\_get](#) (uint32\_t dv\_ind, uint32\_t \*num\_pages, [rsmi\\_retired\\_page\\_record\\_t](#) \*records)

*Get information about reserved ("retired") memory pages.*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_rpms\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, int64\_t \*speed)

*Get the fan speed in RPMs of the device with the specified device index and 0-based sensor index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_speed\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, int64\_t \*speed)

*Get the fan speed for the specified device as a value relative to [RSMI\\_MAX\\_FAN\\_SPEED](#).*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_speed\\_max\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t \*max\_speed)

*Get the max. fan speed of the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_temp\\_metric\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_type, [rsmi\\_temperature\\_metric\\_t](#) metric, int64\_t \*temperature)

*Get the temperature metric value for the specified metric, from the specified temperature sensor on the specified device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_reset](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind)

*Reset the fan to automatic driver control.*
- [rsmi\\_status\\_t rsmi\\_dev\\_fan\\_speed\\_set](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, uint64\_t speed)

*Set the fan speed for the specified device with the provided speed, in RPMs.*
- [rsmi\\_status\\_t rsmi\\_dev\\_busy\\_percent\\_get](#) (uint32\_t dv\_ind, uint32\_t \*busy\_percent)

*Get percentage of time device is busy doing any processing.*
- [rsmi\\_status\\_t rsmi\\_dev\\_perf\\_level\\_get](#) (uint32\_t dv\_ind, [rsmi\\_dev\\_perf\\_level\\_t](#) \*perf)

*Get the performance level of the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_overdrive\\_level\\_get](#) (uint32\_t dv\_ind, uint32\_t \*od)

*Get the overdrive percent associated with the device with provided device index.*
- [rsmi\\_status\\_t rsmi\\_dev\\_gpu\\_clk\\_freq\\_get](#) (uint32\_t dv\_ind, [rsmi\\_clk\\_type\\_t](#) clk\_type, [rsmi\\_frequencies\\_t](#) \*f)

*Get the list of possible system clock speeds of device for a specified clock type.*
- [rsmi\\_status\\_t rsmi\\_dev\\_od\\_volt\\_info\\_get](#) (uint32\_t dv\_ind, [rsmi\\_od\\_volt\\_freq\\_data\\_t](#) \*odv)

*This function retrieves the voltage/frequency curve information.*
- [rsmi\\_status\\_t rsmi\\_dev\\_od\\_volt\\_curve\\_regions\\_get](#) (uint32\_t dv\_ind, uint32\_t \*num\_regions, [rsmi\\_freq\\_volt\\_region\\_t](#) \*buffer)

*This function will retrieve the current valid regions in the frequency/voltage space.*
- [rsmi\\_status\\_t rsmi\\_dev\\_power\\_profile\\_presets\\_get](#) (uint32\_t dv\_ind, uint32\_t sensor\_ind, [rsmi\\_power\\_profile\\_status\\_t](#) \*status)

*Get the list of available preset power profiles and an indication of which profile is currently active.*
- [rsmi\\_status\\_t rsmi\\_dev\\_perf\\_level\\_set](#) (uint32\_t dv\_ind, [rsmi\\_dev\\_perf\\_level\\_t](#) perf\_lvl)

*Set the PowerPlay performance level associated with the device with provided device index with the provided value.*
- [rsmi\\_status\\_t rsmi\\_dev\\_overdrive\\_level\\_set](#) (uint32\_t dv\_ind, uint32\_t od)

*Set the overdrive percent associated with the device with provided device index with the provided value. See details for WARNING.*
- [rsmi\\_status\\_t rsmi\\_dev\\_gpu\\_clk\\_freq\\_set](#) (uint32\_t dv\_ind, [rsmi\\_clk\\_type\\_t](#) clk\_type, uint64\_t freq\_bitmask)

*Control the set of allowed frequencies that can be used for the specified clock.*
- [rsmi\\_status\\_t rsmi\\_version\\_get](#) ([rsmi\\_version\\_t](#) \*version)

*Get the build version information for the currently running build of RSMI.*
- [rsmi\\_status\\_t rsmi\\_version\\_str\\_get](#) ([rsmi\\_sw\\_component\\_t](#) component, char \*ver\_str, uint32\_t len)

*Get the driver version string for the current system.*
- [rsmi\\_status\\_t rsmi\\_dev\\_vbios\\_version\\_get](#) (uint32\_t dv\_ind, char \*vbios, uint32\_t len)

*Get the VBIOS identifier string.*
- [rsmi\\_status\\_t rsmi\\_dev\\_firmware\\_version\\_get](#) (uint32\_t dv\_ind, [rsmi\\_fw\\_block\\_t](#) block, uint64\_t \*fw\_version)

*Get the firmware versions for a device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_count\\_get](#) (uint32\_t dv\_ind, [rsmi\\_gpu\\_block\\_t](#) block, [rsmi\\_error\\_count\\_t](#) \*ec)

- Retrieve the error counts for a GPU block.*
- [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_enabled\\_get](#) (uint32\_t dv\_ind, uint64\_t \*enabled\_blocks)
- Retrieve the enabled ECC bit-mask.*
- [rsmi\\_status\\_t rsmi\\_dev\\_ecc\\_status\\_get](#) (uint32\_t dv\_ind, [rsmi\\_gpu\\_block\\_t](#) block, [rsmi\\_ras\\_err\\_state\\_t](#) \*state)
- Retrieve the ECC status for a GPU block.*
- [rsmi\\_status\\_t rsmi\\_status\\_string](#) ([rsmi\\_status\\_t](#) status, const char \*\*status\_string)
- Get a description of a provided RSMI error status.*
- [rsmi\\_status\\_t rsmi\\_dev\\_counter\\_group\\_supported](#) (uint32\_t dv\_ind, [rsmi\\_event\\_group\\_t](#) group)
- Tell if an event group is supported by a given device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_counter\\_create](#) (uint32\_t dv\_ind, [rsmi\\_event\\_type\\_t](#) type, [rsmi\\_event\\_handle\\_t](#) \*evnt\_handle)
- Create a performance counter object.*
- [rsmi\\_status\\_t rsmi\\_dev\\_counter\\_destroy](#) ([rsmi\\_event\\_handle\\_t](#) evnt\_handle)
- Deallocate a performance counter object.*
- [rsmi\\_status\\_t rsmi\\_counter\\_control](#) ([rsmi\\_event\\_handle\\_t](#) evt\_handle, [rsmi\\_counter\\_command\\_t](#) cmd, void \*cmd\_args)
- Issue performance counter control commands.*
- [rsmi\\_status\\_t rsmi\\_counter\\_read](#) ([rsmi\\_event\\_handle\\_t](#) evt\_handle, [rsmi\\_counter\\_value\\_t](#) \*value)
- Read the current value of a performance counter.*
- [rsmi\\_status\\_t rsmi\\_counter\\_available\\_counters\\_get](#) (uint32\_t dv\_ind, [rsmi\\_event\\_group\\_t](#) grp, uint32\_t \*available)
- Get the number of currently available counters.*
- [rsmi\\_status\\_t rsmi\\_compute\\_process\\_info\\_get](#) ([rsmi\\_process\\_info\\_t](#) \*procs, uint32\_t \*num\_items)
- Get process information about processes currently using GPU.*
- [rsmi\\_status\\_t rsmi\\_compute\\_process\\_info\\_by\\_pid\\_get](#) (uint32\_t pid, [rsmi\\_process\\_info\\_t](#) \*proc)
- Get process information about a specific process.*
- [rsmi\\_status\\_t rsmi\\_dev\\_xgmi\\_error\\_status](#) (uint32\_t dv\_ind, [rsmi\\_xgmi\\_status\\_t](#) \*status)
- Retrieve the XGMI error status for a device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_xgmi\\_error\\_reset](#) (uint32\_t dv\_ind)
- Reset the XGMI error status for a device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_supported\\_func\\_iterator\\_open](#) (uint32\_t dv\_ind, [rsmi\\_func\\_id\\_iter\\_handle\\_t](#) \*handle)
- Get a function name iterator of supported RSMI functions for a device.*
- [rsmi\\_status\\_t rsmi\\_dev\\_supported\\_variant\\_iterator\\_open](#) ([rsmi\\_func\\_id\\_iter\\_handle\\_t](#) obj\_h, [rsmi\\_func\\_id\\_iter\\_handle\\_t](#) \*var\_iter)
- Get a variant iterator for a given handle.*
- [rsmi\\_status\\_t rsmi\\_func\\_iter\\_next](#) ([rsmi\\_func\\_id\\_iter\\_handle\\_t](#) handle)
- Advance a function identifier iterator.*
- [rsmi\\_status\\_t rsmi\\_dev\\_supported\\_func\\_iterator\\_close](#) ([rsmi\\_func\\_id\\_iter\\_handle\\_t](#) \*handle)
- Close a variant iterator handle.*
- [rsmi\\_status\\_t rsmi\\_func\\_iter\\_value\\_get](#) ([rsmi\\_func\\_id\\_iter\\_handle\\_t](#) handle, [rsmi\\_func\\_id\\_value\\_t](#) \*value)
- Get the value associated with a function/variant iterator.*

### 7.1.1 Detailed Description

The rocm\_smi library api is new, and therefore subject to change either at the ABI or API level. Instead of marking every function prototype as "unstable", we are instead saying the API is unstable (i.e., changes are possible) while the major version remains 0. This means that if the API/ABI changes, we will not increment the major version to 1. Once the ABI stabilizes, we will increment the major version to 1, and thereafter increment it on all ABI breaks.

Main header file for the ROCm SMI library. All required function, structure, enum, etc. definitions should be defined in this file.

## 7.1.2 Macro Definition Documentation

### 7.1.2.1 `#define RSMI_MAX_FAN_SPEED 255`

Maximum possible value for fan speed. Should be used as the denominator when determining fan speed percentage.

### 7.1.2.2 `#define RSMI_DEFAULT_VARIANT 0xFFFFFFFFFFFFFFFF`

Place-holder "variant" for functions that have don't have any variants, but do have monitors or sensors.

## 7.1.3 Typedef Documentation

### 7.1.3.1 `typedef uintptr_t rsmi_event_handle_t`

Handle to performance event counter.

Event counter types

## 7.1.4 Enumeration Type Documentation

### 7.1.4.1 `enum rsmi_status_t`

Error codes returned by rocm\_smi\_lib functions.

Enumerator

***RSMI\_STATUS\_SUCCESS*** Operation was successful.

***RSMI\_STATUS\_INVALID\_ARGS*** Passed in arguments are not valid.

***RSMI\_STATUS\_NOT\_SUPPORTED*** The requested information or action is not available for the given input, on the given system

***RSMI\_STATUS\_FILE\_ERROR*** Problem accessing a file. This may because the operation is not supported by the Linux kernel version running on the executing machine

***RSMI\_STATUS\_PERMISSION*** Permission denied/EACCESS file error. Many functions require root access to run.

***RSMI\_STATUS\_OUT\_OF\_RESOURCES*** Unable to acquire memory or other resource

***RSMI\_STATUS\_INTERNAL\_EXCEPTION*** An internal exception was caught.

***RSMI\_STATUS\_INPUT\_OUT\_OF\_BOUNDS*** The provided input is out of allowable or safe range

***RSMI\_STATUS\_INIT\_ERROR*** An error occurred when rsmi initializing internal data structures

***RSMI\_STATUS\_NOT\_YET\_IMPLEMENTED*** The requested function has not yet been implemented in the current system for the current devices

***RSMI\_STATUS\_NOT\_FOUND*** An item was searched for but not found

***RSMI\_STATUS\_INSUFFICIENT\_SIZE*** Not enough resources were available for the operation

***RSMI\_STATUS\_INTERRUPT*** An interrupt occurred during execution of function

***RSMI\_STATUS\_UNEXPECTED\_SIZE*** An unexpected amount of data was read

***RSMI\_STATUS\_NO\_DATA*** No data was found for a given input

***RSMI\_STATUS\_UNKNOWN\_ERROR*** An unknown error occurred.

## 7.1.4.2 enum rsmi\_init\_flags\_t

Initialization flags.

Initialization flags may be OR'd together and passed to [rsmi\\_init\(\)](#).

Enumerator

**RSMI\_INIT\_FLAG\_ALL\_GPUS** Attempt to add all GPUs found (including non-AMD) to the list of devices from which SMI information can be retrieved. By default, only AMD devices are enumerated by RSMI.

## 7.1.4.3 enum rsmi\_dev\_perf\_level\_t

PowerPlay performance levels.

Enumerator

**RSMI\_DEV\_PERF\_LEVEL\_AUTO** Performance level is "auto".

**RSMI\_DEV\_PERF\_LEVEL\_LOW** Keep PowerPlay levels "low", regardless of workload

**RSMI\_DEV\_PERF\_LEVEL\_HIGH** Keep PowerPlay levels "high", regardless of workload

**RSMI\_DEV\_PERF\_LEVEL\_MANUAL** Only use values defined by manually setting the RSMI\_CLK\_TYP↔E\_SYS speed

**RSMI\_DEV\_PERF\_LEVEL\_STABLE\_STD** Stable power state with profiling clocks

**RSMI\_DEV\_PERF\_LEVEL\_STABLE\_PEAK** Stable power state with peak clocks.

**RSMI\_DEV\_PERF\_LEVEL\_STABLE\_MIN\_MCLK** Stable power state with minimum memory clock

**RSMI\_DEV\_PERF\_LEVEL\_STABLE\_MIN\_SCLK** Stable power state with minimum system clock

**RSMI\_DEV\_PERF\_LEVEL\_UNKNOWN** Unknown performance level.

## 7.1.4.4 enum rsmi\_sw\_component\_t

Available clock types.

Software components

Enumerator

**RSMI\_SW\_COMP\_DRIVER** Driver.

## 7.1.4.5 enum rsmi\_event\_group\_t

Enum denoting an event group. The value of the enum is the base value for all the event enums in the group.

Event Groups

Enumerator

**RSMI\_EVNT\_GRP\_XGMI** Data Fabric (XGMI) related events.

#### 7.1.4.6 enum rsmi\_event\_type\_t

Event type enum. Events belonging to a particular event group [rsmi\\_event\\_group\\_t](#) should begin enumerating at the [rsmi\\_event\\_group\\_t](#) value for that group.

Event types

Enumerator

***RSMI\_EVNT\_XGMI\_0\_NOP\_TX*** NOPs sent to neighbor 0.  
***RSMI\_EVNT\_XGMI\_0\_REQUEST\_TX*** Outgoing requests to neighbor 0  
***RSMI\_EVNT\_XGMI\_0\_RESPONSE\_TX*** Outgoing responses to neighbor 0  
***RSMI\_EVNT\_XGMI\_0\_BEATS\_TX*** Data beats sent to neighbor 0  
***RSMI\_EVNT\_XGMI\_1\_NOP\_TX*** NOPs sent to neighbor 1.  
***RSMI\_EVNT\_XGMI\_1\_REQUEST\_TX*** neighbor 1 Outgoing requests to  
***RSMI\_EVNT\_XGMI\_1\_RESPONSE\_TX*** Outgoing responses to neighbor 1  
***RSMI\_EVNT\_XGMI\_1\_BEATS\_TX*** Data beats sent to neighbor 1

#### 7.1.4.7 enum rsmi\_counter\_command\_t

Event counter commands

Enumerator

***RSMI\_CNTR\_CMD\_START*** Start the counter.  
***RSMI\_CNTR\_CMD\_STOP*** Stop the counter.

#### 7.1.4.8 enum rsmi\_clk\_type\_t

Clock types

Enumerator

***RSMI\_CLK\_TYPE\_SYS*** System clock.  
***RSMI\_CLK\_TYPE\_DF*** Data Fabric clock (for ASICs running on a separate clock)  
***RSMI\_CLK\_TYPE\_DCEF*** Display Controller Engine clock.  
***RSMI\_CLK\_TYPE\_SOC*** SOC clock.  
***RSMI\_CLK\_TYPE\_MEM*** Memory clock.

## 7.1.4.9 enum rsmi\_temperature\_metric\_t

Temperature Metrics. This enum is used to identify various temperature metrics. Corresponding values will be in millidegrees Celcius.

Enumerator

**RSMI\_TEMP\_CURRENT** Temperature current value.

**RSMI\_TEMP\_MAX** Temperature max value.

**RSMI\_TEMP\_MIN** Temperature min value.

**RSMI\_TEMP\_MAX\_HYST** Temperature hysteresis value for max limit. (This is an absolute temperature, not a delta).

**RSMI\_TEMP\_MIN\_HYST** Temperature hysteresis value for min limit. (This is an absolute temperature, not a delta).

**RSMI\_TEMP\_CRITICAL** Temperature critical max value, typically greater than corresponding temp\_max values.

**RSMI\_TEMP\_CRITICAL\_HYST** Temperature hysteresis value for critical limit. (This is an absolute temperature, not a delta).

**RSMI\_TEMP\_EMERGENCY** Temperature emergency max value, for chips supporting more than two upper temperature limits. Must be equal or greater than corresponding temp\_crit values.

**RSMI\_TEMP\_EMERGENCY\_HYST** Temperature hysteresis value for emergency limit. (This is an absolute temperature, not a delta).

**RSMI\_TEMP\_CRIT\_MIN** Temperature critical min value, typically lower than corresponding temperature minimum values.

**RSMI\_TEMP\_CRIT\_MIN\_HYST** Temperature hysteresis value for critical minimum limit. (This is an absolute temperature, not a delta).

**RSMI\_TEMP\_OFFSET** Temperature offset which is added to the temperature reading by the chip.

**RSMI\_TEMP\_LOWEST** Historical minimum temperature.

**RSMI\_TEMP\_HIGHEST** Historical maximum temperature.

## 7.1.4.10 enum rsmi\_temperature\_type\_t

This enumeration is used to indicate from which part of the device a temperature reading should be obtained.

Enumerator

**RSMI\_TEMP\_TYPE\_EDGE** Edge GPU temperature.

**RSMI\_TEMP\_TYPE\_JUNCTION** Junction/hotspot temperature

**RSMI\_TEMP\_TYPE\_MEMORY** VRAM temperature.

## 7.1.4.11 enum rsmi\_power\_profile\_preset\_masks\_t

Pre-set Profile Selections. These bitmasks can be AND'd with the [rsmi\\_power\\_profile\\_status\\_t.available\\_profiles](#) returned from [rsmi\\_dev\\_power\\_profile\\_presets\\_get](#) to determine which power profiles are supported by the system.

Enumerator

**RSMI\_PWR\_PROF\_PRST\_CUSTOM\_MASK** Custom Power Profile.

**RSMI\_PWR\_PROF\_PRST\_VIDEO\_MASK** Video Power Profile.

**RSMI\_PWR\_PROF\_PRST\_POWER\_SAVING\_MASK** Power Saving Profile.

**RSMI\_PWR\_PROF\_PRST\_COMPUTE\_MASK** Compute Saving Profile.

**RSMI\_PWR\_PROF\_PRST\_VR\_MASK** VR Power Profile. 3D Full Screen Power Profile

**RSMI\_PWR\_PROF\_PRST\_BOOTUP\_DEFAULT** Default Boot Up Profile.

**RSMI\_PWR\_PROF\_PRST\_LAST** Invalid power profile.

## 7.1.4.12 enum rsmi\_gpu\_block\_t

This enum is used to identify different GPU blocks.

## Enumerator

**RSMI\_GPU\_BLOCK\_INVALID** Used to indicate an invalid block  
**RSMI\_GPU\_BLOCK\_UMC** UMC block.  
**RSMI\_GPU\_BLOCK\_SDMA** SDMA block.  
**RSMI\_GPU\_BLOCK\_GFX** GFX block.  
**RSMI\_GPU\_BLOCK\_MMHUB** MMHUB block.  
**RSMI\_GPU\_BLOCK\_ATHUB** ATHUB block.  
**RSMI\_GPU\_BLOCK\_PCIE\_BIF** PCIE\_BIF block.  
**RSMI\_GPU\_BLOCK\_HDP** HDP block.  
**RSMI\_GPU\_BLOCK\_XGMI\_WAFL** XGMI block.  
**RSMI\_GPU\_BLOCK\_DF** DF block.  
**RSMI\_GPU\_BLOCK\_SMN** SMN block.  
**RSMI\_GPU\_BLOCK\_SEM** SEM block.  
**RSMI\_GPU\_BLOCK\_MP0** MP0 block.  
**RSMI\_GPU\_BLOCK\_MP1** MP1 block.  
**RSMI\_GPU\_BLOCK\_FUSE** Fuse block.  
**RSMI\_GPU\_BLOCK\_LAST** for supported blocks The highest bit position

## 7.1.4.13 enum rsmi\_ras\_err\_state\_t

The current ECC state.

## Enumerator

**RSMI\_RAS\_ERR\_STATE\_NONE** No current errors.  
**RSMI\_RAS\_ERR\_STATE\_DISABLED** ECC is disabled.  
**RSMI\_RAS\_ERR\_STATE\_PARITY** ECC errors present, but type unknown.  
**RSMI\_RAS\_ERR\_STATE\_SING\_C** Single correctable error.  
**RSMI\_RAS\_ERR\_STATE\_MULT\_UC** Multiple uncorrectable errors.  
**RSMI\_RAS\_ERR\_STATE\_POISON** Firmware detected error and isolated page. Treat as uncorrectable.  
**RSMI\_RAS\_ERR\_STATE\_ENABLED** ECC is enabled.

## 7.1.4.14 enum rsmi\_memory\_type\_t

Types of memory.

## Enumerator

**RSMI\_MEM\_TYPE\_VRAM** VRAM memory.  
**RSMI\_MEM\_TYPE\_VIS\_VRAM** VRAM memory that is visible.  
**RSMI\_MEM\_TYPE\_GTT** GTT memory.



## 7.1.4.15 enum rsmi\_freq\_ind\_t

The values of this enum are used as frequency identifiers.

Enumerator

***RSMI\_FREQ\_IND\_MIN*** Index used for the minimum frequency value.

***RSMI\_FREQ\_IND\_MAX*** Index used for the maximum frequency value.

***RSMI\_FREQ\_IND\_INVALID*** An invalid frequency index.

## 7.1.4.16 enum rsmi\_memory\_page\_status\_t

Reserved Memory Page States.

Enumerator

***RSMI\_MEM\_PAGE\_STATUS\_RESERVED*** Reserved. This gpu page is reserved and not available for use

***RSMI\_MEM\_PAGE\_STATUS\_PENDING*** Pending. This gpu page is marked as bad and will be marked reserved at the next window.

***RSMI\_MEM\_PAGE\_STATUS\_UNRESERVABLE*** Unable to reserve this page.



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