

# msaSDK Module

## `.utils.sysinfo`

Provides System Information about devices, OS etc.

## Classes

### MSACPUFrequency

Bases: `SQLModel`

Pydantic CPU Frequency Info Model.

#### Attributes

current `class-attribute`

```
current: Optional[float]
```

max `class-attribute`

```
max: Optional[int]
```

min `class-attribute`

```
min: Optional[int]
```

### MSACPUStats

Bases: `SQLModel`

Pydantic CPU Stats Info Model.

#### Attributes

ctx\_switches `class-attribute`

```
ctx_switches: Optional[int]
```

number of context switches (voluntary + involuntary) since boot.

interrupts class-attribute

```
interrupts: Optional[int]
```

number of interrupts since boot.

soft\_interrupts class-attribute

```
soft_interrupts: Optional[int]
```

number of software interrupts since boot. Always set to 0 on Windows and SunOS.

syscalls class-attribute

```
syscalls: Optional[int]
```

number of system calls since boot. Always set to 0 on Linux.

## MSACPUTimes

Bases: SQLModel

Pydantic CPU Timings Info Model.

### Attributes

guest class-attribute

```
guest: Optional[float]
```

(Linux 2.6.24+): time spent running a virtual CPU for guest operating systems under the control of the Linux kernel

guest\_nice class-attribute

```
guest_nice: Optional[int]
```

(Linux 3.2.0+): time spent running a niced guest (virtual CPU for guest operating systems under the control of the Linux kernel)

idle class-attribute

```
idle: Optional[float]
```

time spent doing nothing

iowait class-attribute

```
iowait: Optional[float]
```

(Linux): time spent waiting for I/O to complete. This is not accounted in idle time counter.

irq class-attribute

```
irq: Optional[int]
```

(Linux, BSD): time spent for servicing hardware interrupts

nice class-attribute

```
nice: Optional[int]
```

(UNIX): time spent by niced (prioritized) processes executing in user mode; on Linux this also includes guest\_nice time

softirq class-attribute

```
softirq: Optional[float]
```

(Linux): time spent for servicing software interrupts

steal class-attribute

```
steal: Optional[int]
```

(Linux 2.6.11+): time spent by other operating systems running in a virtualized environment

system class-attribute

```
system: Optional[float]
```

time spent by processes executing in kernel mode

user class-attribute

user: Optional[float]

time spent by normal processes executing in user mode; on Linux this also includes guest time

## MSADiskIO

Bases: SQLModel

Pydantic Disk IO Info Model.

ATTRIBUTE	DESCRIPTION
<small>read_count</small>	number of reads <b>TYPE:</b> <small>Optional[int]</small>
<small>write_count</small>	number of writes <b>TYPE:</b> <small>Optional[int]</small>
<small>read_bytes</small>	number of bytes read <b>TYPE:</b> <small>Optional[int]</small>
<small>write_bytes</small>	number of bytes written <b>TYPE:</b> <small>Optional[int]</small>
<small>read_time</small>	(all except NetBSD and OpenBSD) time spent reading from disk (in milliseconds) <b>TYPE:</b> <small>Optional[int]</small>
<small>write_time</small>	(all except NetBSD and OpenBSD) time spent writing to disk (in milliseconds) <b>TYPE:</b> <small>Optional[int]</small>
<small>busy_time</small>	(Linux, FreeBSD) time spent doing actual I/Os (in milliseconds) <b>TYPE:</b> <small>Optional[int]</small>
<small>read_merged_count</small>	number of merged reads (see iostats doc) <b>TYPE:</b> <small>Linux</small>
<small>write_merged_count</small>	number of merged writes (see iostats doc) <b>TYPE:</b> <small>Linux</small>

## Attributes

busy\_time class-attribute

```
busy_time: Optional[int]
```

read\_bytes class-attribute

```
read_bytes: Optional[int]
```

read\_count class-attribute

```
read_count: Optional[int]
```

read\_merged\_count class-attribute

```
read_merged_count: Optional[int]
```

read\_time class-attribute

```
read_time: Optional[int]
```

write\_bytes class-attribute

```
write_bytes: Optional[int]
```

write\_count class-attribute

```
write_count: Optional[int]
```

write\_merged\_count class-attribute

```
write_merged_count: Optional[int]
```

write\_time class-attribute

```
write_time: Optional[int]
```

## MSAGPUInfo

Bases: `SQLModel`

Pydantic GPU Info Model.

### Attributes

`free_memory` class-attribute

```
free_memory: Optional[str]
```

`id` class-attribute

```
id: Optional[int]
```

`load` class-attribute

```
load: Optional[str]
```

`name` class-attribute

```
name: Optional[str]
```

`temperature` class-attribute

```
temperature: Optional[str]
```

`total_memory` class-attribute

```
total_memory: Optional[str]
```

`used_memory` class-attribute

```
used_memory: Optional[str]
```

`uuid` class-attribute

```
uuid: Optional[str]
```

## MSAMemoryUsage

Bases: `SQLModel`

Pydantic Memory Usage Info Model.

### Attributes

active `class-attribute`

```
active: Optional[float]
```

(UNIX): memory currently in use or very recently used, and so it is in RAM.

available `class-attribute`

```
available: Optional[float]
```

the memory that can be given instantly to processes without the system going into swap. This is calculated by summing different memory values depending on the platform and it is supposed to be used to monitor actual memory usage in a cross platform fashion.

buffers `class-attribute`

```
buffers: Optional[float]
```

(Linux, BSD): cache for things like file system metadata.

cached `class-attribute`

```
cached: Optional[float]
```

(Linux, BSD): cache for various things.

free `class-attribute`

```
free: Optional[float]
```

memory not being used at all (zeroed) that is readily available; note that this doesn't reflect the actual memory available (use available instead). total - used does not necessarily match free.

inactive `class-attribute`

```
inactive: Optional[float]
```

(UNIX): memory that is marked as not used.

percent class-attribute

percent: Optional[float]

the percentage usage calculated as (total - available) / total \* 100

total class-attribute

total: Optional[float]

total physical memory (exclusive swap).

used class-attribute

used: Optional[float]

memory used, calculated differently depending on the platform and designed for informational purposes only. total - free does not necessarily match used.

## MSANetworkAdapter

Bases: SQLModel

Pydantic Network Adapter Info Model.

### Attributes

address class-attribute

address: Optional[str]

the primary NIC address (always set).

broadcast class-attribute

broadcast: Optional[str]

the broadcast address (may be None).

family class-attribute

family: Optional[int]



the address family, either AF\_INET or AF\_INET6 or psutil.AF\_LINK, which refers to a MAC address.

netmask class-attribute

```
netmask: Optional[str]
```

the netmask address (may be None).

ptp class-attribute

```
ptp: Optional[int]
```

stands for “point to point”; it’s the destination address on a point to point interface (typically a VPN). broadcast and ptp are mutually exclusive. May be None.

## MSANetworkAdapters

Bases: SQLModel

Pydantic Network Adapters List Model.

### Attributes

adapters class-attribute

```
adapters: List[MSANetworkAdapter] = []
```

name class-attribute

```
name: str = ''
```

## MSANetworkConnection

Bases: SQLModel

Pydantic Network Connection Info Model.

### Attributes

family class-attribute

```
family: Optional[int]
```

the address family, either AF\_INET, AF\_INET6 or AF\_UNIX.

file\_descriptor class-attribute

```
file_descriptor: Optional[int]
```

the socket file descriptor. If the connection refers to the current process this may be passed to socket.fromfd to obtain a usable socket object. On Windows and SunOS this is always set to -1.

index class-attribute

```
index: Optional[int]
```

local\_addr class-attribute

```
local_addr: Optional[str]
```

the local address as a (ip, port) named tuple or a path in case of AF\_UNIX sockets. For UNIX sockets see notes below.

pid class-attribute

```
pid: Optional[int]
```

the PID of the process which opened the socket, if retrievable, else None. On some platforms (e.g. Linux) the availability of this field changes depending on process privileges (root is needed).

remote\_addr class-attribute

```
remote_addr: Optional[str]
```

the remote address as a (ip, port) named tuple or an absolute path in case of UNIX sockets. When the remote endpoint is not connected you'll get an empty tuple (AF\_INET\*) or "" (AF\_UNIX). For UNIX sockets see notes below.

status class-attribute

```
status: str = ''
```

represents the status of a TCP connection. The return value is one of the psutil.CONN\_\* constants (a string). For UDP and UNIX sockets this is always going to be psutil.CONN\_NONE.

type class-attribute

```
type: Optional[int]
```

the address type, either `SOCK_STREAM`, `SOCK_DGRAM` or `SOCK_SEQPACKET`.

## MSANetworkIO

Bases: `SQLModel`

Pydantic Network IO Info Model.

ATTRIBUTE	DESCRIPTION
<code>bytes_sent</code>	number of bytes sent <b>TYPE:</b> <code>Optional[int]</code>
<code>bytes_recv</code>	number of bytes received <b>TYPE:</b> <code>Optional[int]</code>
<code>packets_sent</code>	number of packets sent <b>TYPE:</b> <code>Optional[int]</code>
<code>packets_recv</code>	number of packets received <b>TYPE:</b> <code>Optional[int]</code>
<code>errin</code>	total number of errors while receiving <b>TYPE:</b> <code>Optional[int]</code>
<code>errout</code>	total number of errors while sending <b>TYPE:</b> <code>Optional[int]</code>
<code>dropin</code>	total number of incoming packets which were dropped <b>TYPE:</b> <code>Optional[int]</code>
<code>dropout</code>	total number of outgoing packets which were dropped (always 0 on macOS and BSD) <b>TYPE:</b> <code>Optional[int]</code>

### Attributes

`bytes_recv` class-attribute

```
bytes_recv: Optional[int]
```

bytes\_sent class-attribute

```
bytes_sent: Optional[int]
```

dropin class-attribute

```
dropin: Optional[int]
```

dropout class-attribute

```
dropout: Optional[int]
```

errin class-attribute

```
errin: Optional[int]
```

errout class-attribute

```
errout: Optional[int]
```

packets\_recv class-attribute

```
packets_recv: Optional[int]
```

packets\_sent class-attribute

```
packets_sent: Optional[int]
```

## MSANetworkStat

Bases: SQLModel

Pydantic Network Stats Info Model.

### Attributes

duplex class-attribute

```
duplex: Optional[int]
```

the duplex communication type; it can be either `NIC_DUPLEX_FULL`, `NIC_DUPLEX_HALF` or `NIC_DUPLEX_UNKNOWN`.

`isup` class-attribute

```
isup: Optional[bool]
```

a bool indicating whether the NIC is up and running (meaning ethernet cable or Wi-Fi is connected).

`mtu` class-attribute

```
mtu: Optional[int]
```

NIC's maximum transmission unit expressed in bytes.

`speed` class-attribute

```
speed: Optional[int]
```

the NIC speed expressed in mega bits (MB), if it can't be determined (e.g. 'localhost') it will be set to 0.

## MSANetworkStats

Bases: `SQLModel`

Pydantic Network Stats List Info Model.

### Attributes

`adapters` class-attribute

```
adapters: List[MSANetworkStat] = []
```

`name` class-attribute

```
name: str = ''
```

## MSASwap

Bases: `SQLModel`

Pydantic Swapfile Info Model.

### Attributes

free class-attribute

```
free: Optional[float]
```

percent class-attribute

```
percent: Optional[float]
```

the percentage usage calculated as  $(\text{total} - \text{available}) / \text{total} * 100$

total class-attribute

```
total: Optional[float]
```

used class-attribute

```
used: Optional[float]
```

## MSASystemGPUInfo

Bases: SQLModel

Pydantic System GPU Info Model.

### Attributes

CPU\_Logical class-attribute

```
CPU_Logical: Optional[int]
```

CPU\_Physical class-attribute

```
CPU_Physical: Optional[int]
```

GPUs class-attribute

```
GPUs: Optional[List[MSAGPUInfo]]
```

HW\_Identifier class-attribute

```
HW_Identifier: str = ''
```

Host\_Name class-attribute

```
Host_Name: str = ''
```

IP\_Address class-attribute

```
IP_Address: str = ''
```

MAC\_Address class-attribute

```
MAC_Address: str = ''
```

Memory\_Available class-attribute

```
Memory_Available: str = ''
```

Memory\_Physical class-attribute

```
Memory_Physical: str = ''
```

Node\_Name class-attribute

```
Node_Name: str = ''
```

OS\_Name class-attribute

```
OS_Name: str = ''
```

OS\_Release class-attribute

```
OS_Release: str = ''
```

OS\_Version class-attribute

```
OS_Version: str = ''
```

PID class-attribute

```
PID: Optional[int]
```

Runtime\_Cmd class-attribute

```
Runtime_Cmd: List[str] = []
```

Runtime\_Exe class-attribute

```
Runtime_Exe: str = ''
```

Runtime\_Status class-attribute

```
Runtime_Status: str = ''
```

Service\_Start class-attribute

```
Service_Start: str = ''
```

System\_Boot class-attribute

```
System_Boot: str = ''
```

## MSASystemInfo

Bases: SQLModel

Pydantic System Info Model.

### Attributes

CPU\_Affinity class-attribute

```
CPU_Affinity: Optional[int]
```

CPU\_Current class-attribute

```
CPU_Current: Optional[int]
```



### CPU\_Frequency class-attribute

```
CPU_Frequency: Optional[MSACPUFrequency]
```

### CPU\_LoadAvg class-attribute

```
CPU_LoadAvg: Optional[List[float]]
```

### CPU\_Logical class-attribute

```
CPU_Logical: Optional[int]
```

Amount of logical (each physical core doing 2 or more threads, hyperthreading) CPU's

### CPU\_Physical class-attribute

```
CPU_Physical: Optional[int]
```

Amount of physical CPU's

### CPU\_Stats class-attribute

```
CPU_Stats: Optional[MSACPUStats]
```

### CPU\_Times class-attribute

```
CPU_Times: Optional[MSACPUTimes]
```

### CPU\_Usage\_Name class-attribute

```
CPU_Usage_Name: str = ''
```

### CPU\_Usage\_Process class-attribute

```
CPU_Usage_Process: Optional[float]
```

### CPU\_Usage\_Total class-attribute

```
CPU_Usage_Total: Optional[float]
```

**Disk\_IO** class-attribute

```
Disk_IO: Optional[MSADiskIO]
```

**HW\_Identifier** class-attribute

```
HW_Identifier: str = ''
```

**Host\_Name** class-attribute

```
Host_Name: str = ''
```

**IP\_Address** class-attribute

```
IP_Address: str = ''
```

**MAC\_Address** class-attribute

```
MAC_Address: str = ''
```

**Memory\_Available** class-attribute

```
Memory_Available: str = ''
```

**Memory\_Physical** class-attribute

```
Memory_Physical: str = ''
```

**Memory\_Usage** class-attribute

```
Memory_Usage: Optional[MSAMemoryUsage]
```

**Network\_Adapters** class-attribute

```
Network_Adapters: Optional[List[MSANetworkAdapters]]
```

**Network\_Connections** class-attribute

```
Network_Connections: Optional[List[MSANetworkConnection]]
```

**Network\_IO** class-attribute

```
Network_IO: Optional[MSANetworkIO]
```

**Network\_Stats** class-attribute

```
Network_Stats: Optional[List[MSANetworkStats]]
```

**Node\_Name** class-attribute

```
Node_Name: str = ''
```

**OS\_Name** class-attribute

```
OS_Name: str = ''
```

**OS\_Release** class-attribute

```
OS_Release: str = ''
```

**OS\_Version** class-attribute

```
OS_Version: str = ''
```

**PID** class-attribute

```
PID: Optional[int]
```

**Runtime\_Cmd** class-attribute

```
Runtime_Cmd: List[str] = []
```

**Runtime\_Exe** class-attribute

```
Runtime_Exe: str = ''
```

**Runtime\_Status** class-attribute

```
Runtime_Status: str = ''
```

Service Status, running or stopped

Service\_Start class-attribute

```
Service_Start: str = ''
```

Swap class-attribute

```
Swap: Optional[MSASwap]
```

System\_Boot class-attribute

```
System_Boot: str = ''
```

Temperatures class-attribute

```
Temperatures: Optional[List[MSATemperatures]]
```

## MSATemperature

Bases: SQLModel

Pydantic Temperature Info Model.

### Attributes

critical class-attribute

```
critical: Optional[float]
```

current class-attribute

```
current: Optional[float]
```

high class-attribute

```
high: Optional[float]
```

label class-attribute

```
label: Optional[str]
```

# MSATemperatures

Bases: `SQLModel`

Pydantic Temperatures List Model.

**Attributes**

device `class-attribute`

```
device: str = ''
```

temps `class-attribute`

```
temps: List[MSATemperature] = []
```

## Functions

### get\_cpu\_freq

```
get_cpu_freq() -> MSACPUFrequency
```

Get psutil.cpu\_freq()

RETURNS	DESCRIPTION
<code>cpf</code>	MSACPUFrequency <b>TYPE:</b> <code>MSACPUFrequency</code>

### get\_cpu\_stats

```
get_cpu_stats() -> MSACPUStats
```

Get psutil.cpu\_times()

RETURNS	DESCRIPTION

RETURNS	DESCRIPTION
<code>cst</code>	MSACPUStats <b>TYPE:</b> <code>MSACPUStats</code>

## get\_cpu\_times

```
get_cpu_times() -> MSACPUTimes
```

Get psutil.cpu\_times()

RETURNS	DESCRIPTION
<code>cti</code>	MSACPUTimes <b>TYPE:</b> <code>MSACPUTimes</code>

## get\_cpu\_usage

```
get_cpu_usage(
    user: str = None, ignore_self: bool = False
) -> tuple[int, int, str]
```

Returns the total CPU usage for all available cores.

PARAMETER	DESCRIPTION
<code>user</code>	If given, returns only the total CPU usage of all processes for the given user. <b>TYPE:</b> <code>str</code> <b>DEFAULT:</b> <code>None</code>
<code>ignore_self</code>	If <code>True</code> the process that runs this script will be ignored. <b>TYPE:</b> <code>bool</code> <b>DEFAULT:</b> <code>False</code>

RETURNS	DESCRIPTION
<code>total</code>	total usage <b>TYPE:</b> <code>int</code>

RETURNS	DESCRIPTION
<code>largest_process</code>	largest process usage <b>TYPE:</b> <code>int</code>
<code>largest_process_name</code>	name of the largest process <b>TYPE:</b> <code>str</code>

## get\_disk\_io

```
get_disk_io() -> MSADiskIO
```

Get psutil.disk\_io\_counters()

RETURNS	DESCRIPTION
<code>dio</code>	MSADiskIO <b>TYPE:</b> <code>MSADiskIO</code>

## get\_gpus

```
get_gpus() -> List[MSAGPUInfo]
```

Get GPUUtil.getGPUs()

RETURNS	DESCRIPTION
<code>list_gpus</code>	List[MSAGPUInfo] = [] <b>TYPE:</b> <code>List[MSAGPUInfo]</code>

## get\_hostname

```
get_hostname() -> str
```

Get socket.gethostname()

RETURNS	DESCRIPTION
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RETURNS	DESCRIPTION
<code>hostname</code>	str <b>TYPE:</b> <code>str</code>

## get\_list\_partitions

```
get_list_partitions() -> List
```

Get psutil.disk\_partitions()

RETURNS	DESCRIPTION
<code>partitions_list</code>	List = [] <b>TYPE:</b> <code>List</code>

## get\_load\_average

```
get_load_average() -> tuple[float, float, float]
```

Returns the CPU load average in tuple[1min, 5min, 15min].

RETURNS	DESCRIPTION
<code>1min</code>	total usage <b>TYPE:</b> <code>float</code>
<code>5min</code>	largest process usage <b>TYPE:</b> <code>float</code>
<code>15min</code>	name of the largest process <b>TYPE:</b> <code>float</code>

## get\_map\_disk\_usage

```
get_map_disk_usage() -> Dict
```

Get get\_partition\_usage(get\_list\_partitions())



RETURNS	DESCRIPTION
<code>rdict</code>	Dict <b>TYPE:</b> <code>Dict</code>

## get\_memory\_usage

```
get_memory_usage() -> MSAMemoryUsage
```

Get psutil.virtual\_memory()

RETURNS	DESCRIPTION
<code>mu</code>	MSAMemoryUsage <b>TYPE:</b> <code>MSAMemoryUsage</code>

## get\_network\_adapters

```
get_network_adapters() -> List[MSANetworkAdapters]
```

Get psutil.net\_if\_addrs()

RETURNS	DESCRIPTION
<code>ret</code>	List[MSANetworkAdapters] = [] <b>TYPE:</b> <code>List[MSANetworkAdapters]</code>

## get\_network\_connections

```
get_network_connections() -> List[MSANetworkConnection]
```

Get psutil.net\_connections()

RETURNS	DESCRIPTION
<code>rlist</code>	List[MSANetworkConnection] = [] <b>TYPE:</b> <code>List[MSANetworkConnection]</code>

## get\_network\_io

```
get_network_io() -> MSANetworkIO
```

Get psutil.net\_io\_counters()

RETURNS	DESCRIPTION
<code>nio</code>	MSANetworkIO <b>TYPE:</b> <code>MSANetworkIO</code>

## get\_network\_stats

```
get_network_stats() -> List[MSANetworkStats]
```

Get psutil.net\_if\_stats()

RETURNS	DESCRIPTION
<code>ret</code>	List[MSANetworkStats] = [] <b>TYPE:</b> <code>List[MSANetworkStats]</code>

## get\_partition\_usage

```
get_partition_usage(partitions) -> Dict
```

Get psutil.disk\_usage(partition)

RETURNS	DESCRIPTION
<code>ret</code>	Dict = {"partition": list, "total": list, "used": list, "free": list, "percent": list} <b>TYPE:</b> <code>Dict</code>

## get\_swap

```
get_swap() -> MSASwap
```

Get psutil.swap\_memory()

RETURNS	DESCRIPTION
<code>sw</code>	MSASwap <b>TYPE:</b> <code>MSASwap</code>

## get\_sysgpuinfo

```
get_sysgpuinfo() -> MSASystemGPUInfo
```

Get MSASystemGPUInfo

RETURNS	DESCRIPTION
<code>system_gpu_info</code>	Pydantic System GPU Info Model. <b>TYPE:</b> <code>MSASystemGPUInfo</code>

## get\_sysinfo

```
get_sysinfo() -> MSASystemInfo
```

Get MSASystemInfo

RETURNS	DESCRIPTION
<code>system_info</code>	Pydantic System Info Model. <b>TYPE:</b> <code>MSASystemInfo</code>

## get\_temperatures

```
get_temperatures() -> List[MSATemperatures]
```

Get psutil.sensors\_temperatures()

RETURNS	DESCRIPTION
<code>ret</code>	List[MSATemperatures] = [] <b>TYPE:</b> <code>List[MSATemperatures]</code>

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