

Guest Agent Protocol Reference Manual

QEMU version 4.1.0

This is the QEMU Guest Agent Protocol reference manual.

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1 API Reference

General note concerning the use of guest agent interfaces:

"unsupported" is a higher-level error than the errors that individual commands might document. The caller should always be prepared to receive QERR_UNSUPPORTED, even if the given command doesn't specify it, or doesn't document any failure mode at all.

guest-sync-delimited

[Command]

Echo back a unique integer value, and prepend to response a leading sentinel byte (0xFF) the client can check scan for.

This is used by clients talking to the guest agent over the wire to ensure the stream is in sync and doesn't contain stale data from previous client. It must be issued upon initial connection, and after any client-side timeouts (including timeouts on receiving a response to this command).

After issuing this request, all guest agent responses should be ignored until the response containing the unique integer value the client passed in is returned. Receival of the 0xFF sentinel byte must be handled as an indication that the client's lexer/tokenizer/parser state should be flushed/reset in preparation for reliably receiving the subsequent response. As an optimization, clients may opt to ignore all data until a sentinel value is receiving to avoid unnecessary processing of stale data.

Similarly, clients should also precede this **request** with a 0xFF byte to make sure the guest agent flushes any partially read JSON data from a previous client connection.

Arguments:

id: int randomly generated 64-bit integer

Returns: The unique integer id passed in by the client

Since: 1.1

guest-sync [Command]

Echo back a unique integer value

This is used by clients talking to the guest agent over the wire to ensure the stream is in sync and doesn't contain stale data from previous client. All guest agent responses should be ignored until the provided unique integer value is returned, and it is up to the client to handle stale whole or partially-delivered JSON text in such a way that this response can be obtained.

In cases where a partial stale response was previously received by the client, this cannot always be done reliably. One particular scenario being if qemu-ga responses are fed character-by-character into a JSON parser. In these situations, using guest-sync-delimited may be optimal.

For clients that fetch responses line by line and convert them to JSON objects, guest-sync should be sufficient, but note that in cases where the channel is dirty some attempts at parsing the response may result in a parser error.

Such clients should also precede this command with a 0xFF byte to make sure the guest agent flushes any partially read JSON data from a previous session.

Arguments:

id: int randomly generated 64-bit integer

Returns: The unique integer id passed in by the client

Since: 0.15.0

guest-ping [Command]

Ping the guest agent, a non-error return implies success

Since: 0.15.0

guest-get-time

[Command]

Get the information about guest's System Time relative to the Epoch of 1970-01-01 in UTC.

Returns: Time in nanoseconds.

Since: 1.5

guest-set-time

[Command]

Set guest time.

When a guest is paused or migrated to a file then loaded from that file, the guest OS has no idea that there was a big gap in the time. Depending on how long the gap was, NTP might not be able to resynchronize the guest.

This command tries to set guest's System Time to the given value, then sets the Hardware Clock (RTC) to the current System Time. This will make it easier for a guest to resynchronize without waiting for NTP. If no time is specified, then the time to set is read from RTC. However, this may not be supported on all platforms (i.e. Windows). If that's the case users are advised to always pass a value.

Arguments:

time: int (optional)

time of nanoseconds, relative to the Epoch of 1970-01-01 in UTC.

Returns: Nothing on success.

Since: 1.5

GuestAgentCommandInfo

[Object]

Information about guest agent commands.

Members:

name: string

name of the command

enabled: boolean

whether command is currently enabled by guest admin

success-response: boolean

whether command returns a response on success (since 1.7)

Since: 1.1.0

GuestAgentInfo

[Object]

Information about guest agent.

Members:

version: string

guest agent version

supported_commands: array of GuestAgentCommandInfo

Information about guest agent commands

Since: 0.15.0

guest-info

Get some information about the guest agent.

Returns: GuestAgentInfo

Since: 0.15.0

guest-shutdown

[Command]

[Command]

Initiate guest-activated shutdown. Note: this is an asynchronous shutdown request, with no guarantee of successful shutdown.

Arguments:

mode: string (optional)

"halt", "powerdown" (default), or "reboot"

This command does NOT return a response on success. Success condition is indicated by the VM exiting with a zero exit status or, when running with –no-shutdown, by issuing the query-status QMP command to confirm the VM status is "shutdown".

Since: 0.15.0

guest-file-open

[Command]

Open a file in the guest and retrieve a file handle for it

Arguments:

path: string

Full path to the file in the guest to open.

mode: string (optional)

open mode, as per fopen(), "r" is the default.

Returns: Guest file handle on success.

Since: 0.15.0

guest-file-close

[Command]

Close an open file in the guest

Arguments:

handle: int

filehandle returned by guest-file-open

Returns: Nothing on success.

Since: 0.15.0

GuestFileRead

[Object]

Result of guest agent file-read operation

Members:

count: int

number of bytes read (note: count is **before** base64-encoding is applied)

buf-b64: string

base64-encoded bytes read

eof: boolean

whether EOF was encountered during read operation.

Since: 0.15.0

guest-file-read

[Command]

Read from an open file in the guest. Data will be base64-encoded

Arguments:

handle: int

filehandle returned by guest-file-open

count: int (optional)

maximum number of bytes to read (default is 4KB)

Returns: GuestFileRead on success.

Since: 0.15.0

GuestFileWrite [Object]

Result of guest agent file-write operation

Members:

count: int

number of bytes written (note: count is actual bytes written, after base64-decoding of provided buffer)

eof: boolean

whether EOF was encountered during write operation.

Since: 0.15.0

guest-file-write

[Command]

Write to an open file in the guest.

Arguments:

handle: int

filehandle returned by guest-file-open

buf-b64: string

base64-encoded string representing data to be written

count: int (optional)

bytes to write (actual bytes, after base64-decode), default is all content in buf-b64 buffer after base64 decoding

Returns: GuestFileWrite on success.

Since: 0.15.0

GuestFileSeek [Object]

Result of guest agent file-seek operation

Members:

position: int

current file position

eof: boolean

whether EOF was encountered during file seek

Since: 0.15.0

QGASeek [Enum]

Symbolic names for use in guest-file-seek

Values:

set Set to the specified offset (same effect as 'whence':0)

cur Add offset to the current location (same effect as 'whence':1)

end Add offset to the end of the file (same effect as 'whence':2)

Since: 2.6

GuestFileWhence [Alternate]

Controls the meaning of offset to guest-file-seek.

Members:

value: int

Integral value (0 for set, 1 for cur, 2 for end), available for historical reasons, and might differ from the host's or guest's SEEK_* values (since: 0.15)

name: QGASeek

Symbolic name, and preferred interface

Since: 2.6

guest-file-seek

[Command]

Seek to a position in the file, as with fseek(), and return the current file position afterward. Also encapsulates ftell()'s functionality, with offset=0 and whence=1.

Arguments:

handle: int

filehandle returned by guest-file-open

offset: int

bytes to skip over in the file stream

whence: GuestFileWhence

Symbolic or numeric code for interpreting offset

Returns: GuestFileSeek on success.

Since: 0.15.0

guest-file-flush

[Command]

Write file changes bufferred in userspace to disk/kernel buffers

Arguments:

handle: int

filehandle returned by guest-file-open

Returns: Nothing on success.

Since: 0.15.0

GuestFsfreezeStatus

[Enum]

An enumeration of filesystem freeze states

Values:

thawed filesystems thawed/unfrozen

frozen all non-network guest filesystems frozen

Since: 0.15.0

guest-fsfreeze-status

[Command]

Get guest fsfreeze state. error state indicates

Returns: GuestFsfreezeStatus ("thawed", "frozen", etc., as defined below)

Note: This may fail to properly report the current state as a result of some other guest processes having issued an fs freeze/thaw.

Since: 0.15.0

guest-fsfreeze-freeze

[Command]

Sync and freeze all freezable, local guest filesystems. If this command succeeded, you may call <code>guest-fsfreeze-thaw</code> later to unfreeze.

Note: On Windows, the command is implemented with the help of a Volume Shadow-copy Service DLL helper. The frozen state is limited for up to 10 seconds by VSS.

Returns: Number of file systems currently frozen. On error, all filesystems will be thawed. If no filesystems are frozen as a result of this call, then guest-fsfreeze-status will remain "thawed" and calling guest-fsfreeze-thaw is not necessary.

Since: 0.15.0

guest-fsfreeze-freeze-list

[Command]

Sync and freeze specified guest filesystems. See also guest-fsfreeze-freeze.

Arguments:

mountpoints: array of string (optional)

an array of mountpoints of filesystems to be frozen. If omitted, every mounted filesystem is frozen. Invalid mount points are ignored.

Returns: Number of file systems currently frozen. On error, all filesystems will be thawed.

guest-fsfreeze-thaw

[Command]

Unfreeze all frozen guest filesystems

Returns: Number of file systems thawed by this call

Note: if return value does not match the previous call to guest-fsfreeze-freeze, this likely means some freezable filesystems were unfrozen before this call, and that the filesystem state may have changed before issuing this command.

Since: 0.15.0

GuestFilesystemTrimResult

[Object]

Members:

path: string

path that was trimmed

error: string (optional)

an error message when trim failed

trimmed: int (optional)

bytes trimmed for this path

minimum: int (optional)

reported effective minimum for this path

Since: 2.4

GuestFilesystemTrimResponse

[Object]

Members:

paths: array of GuestFilesystemTrimResult

list of GuestFilesystemTrimResult per path that was trimmed

Since: 2.4

guest-fstrim

[Command]

Discard (or "trim") blocks which are not in use by the filesystem.

Arguments:

minimum: int (optional)

Minimum contiguous free range to discard, in bytes. Free ranges smaller than this may be ignored (this is a hint and the guest may not respect it). By increasing this value, the fstrim operation will complete more quickly for filesystems with badly fragmented free space, although not all blocks will be discarded. The default value is zero, meaning "discard every free block".

Returns: A GuestFilesystemTrimResponse which contains the status of all trimmed paths. (since 2.4)

Since: 1.2

guest-suspend-disk

[Command]

Suspend guest to disk.

This command attempts to suspend the guest using three strategies, in this order:

systemd hibernate

- pm-utils (via pm-hibernate)
- manual write into sysfs

This command does NOT return a response on success. There is a high chance the command succeeded if the VM exits with a zero exit status or, when running with – no-shutdown, by issuing the query-status QMP command to to confirm the VM status is "shutdown". However, the VM could also exit (or set its status to "shutdown") due to other reasons.

The following errors may be returned: If suspend to disk is not supported, Unsupported

Notes: It's strongly recommended to issue the guest-sync command before sending commands when the guest resumes

Since: 1.1

guest-suspend-ram

[Command]

Suspend guest to ram.

This command attempts to suspend the guest using three strategies, in this order:

- systemd suspend
- pm-utils (via pm-suspend)
- manual write into sysfs

IMPORTANT: guest-suspend-ram requires working wakeup support in QEMU. You should check QMP command query-current-machine returns wakeup-suspend-support: true before issuing this command. Failure in doing so can result in a suspended guest that QEMU will not be able to awaken, forcing the user to power cycle the guest to bring it back.

This command does NOT return a response on success. There are two options to check for success:

- 1. Wait for the SUSPEND QMP event from QEMU
- 2. Issue the query-status QMP command to confirm the VM status is "suspended"

The following errors may be returned: If suspend to ram is not supported, Unsupported

Notes: It's strongly recommended to issue the guest-sync command before sending commands when the guest resumes

Since: 1.1

guest-suspend-hybrid

[Command]

Save guest state to disk and suspend to ram.

This command attempts to suspend the guest by executing, in this order:

- systemd hybrid-sleep
- pm-utils (via pm-suspend-hybrid)

IMPORTANT: guest-suspend-hybrid requires working wakeup support in QEMU. You should check QMP command query-current-machine returns wakeup-suspend-support: true before issuing this command. Failure in doing so can result in a suspended guest that QEMU will not be able to awaken, forcing the user to power cycle the guest to bring it back.

This command does NOT return a response on success. There are two options to check for success:

- 1. Wait for the SUSPEND QMP event from QEMU
- 2. Issue the query-status QMP command to confirm the VM status is "suspended"

The following errors may be returned: If hybrid suspend is not supported, Unsupported

Notes: It's strongly recommended to issue the guest-sync command before sending commands when the guest resumes

Since: 1.1

GuestIpAddressType

[Enum]

An enumeration of supported IP address types

Values:

ipv4 IP version 4ipv6 IP version 6

Since: 1.1

${\tt GuestIpAddress}$

[Object]

Members:

ip-address: string IP address

ip-address-type: GuestIpAddressType

Type of ip-address (e.g. ipv4, ipv6)

prefix: int

Network prefix length of ip-address

Since: 1.1

${\tt GuestNetworkInterfaceStat}$

[Object]

Members:

rx-bytes: int

total bytes received

rx-packets: int

total packets received

rx-errs: int

bad packets received

rx-dropped: int

receiver dropped packets

tx-bytes: int

total bytes transmitted

tx-packets: int

total packets transmitted

tx-errs: int

packet transmit problems

tx-dropped: int

dropped packets transmitted

Since: 2.11

GuestNetworkInterface

[Object]

Members:

name: string

The name of interface for which info are being delivered

hardware-address: string (optional)

Hardware address of name

ip-addresses: array of GuestIpAddress (optional)

List of addresses assigned to name

statistics: GuestNetworkInterfaceStat (optional)

various statistic counters related to name (since 2.11)

Since: 1.1

guest-network-get-interfaces

[Command]

Get list of guest IP addresses, MAC addresses and netmasks.

Returns: List of GuestNetworkInfo on success.

Since: 1.1

GuestLogicalProcessor

[Object]

Members:

logical-id: int

Arbitrary guest-specific unique identifier of the VCPU.

online: boolean

Whether the VCPU is enabled.

can-offline: boolean (optional)

Whether offlining the VCPU is possible. This member is always filled in by the guest agent when the structure is returned, and always ignored on input (hence it can be omitted then).

Since: 1.5

guest-get-vcpus

[Command]

Retrieve the list of the guest's logical processors.

This is a read-only operation.

Returns: The list of all VCPUs the guest knows about. Each VCPU is put on the list exactly once, but their order is unspecified.

Since: 1.5

guest-set-vcpus

[Command]

Attempt to reconfigure (currently: enable/disable) logical processors inside the guest. The input list is processed node by node in order. In each node logical-id is used to look up the guest VCPU, for which online specifies the requested state. The set of distinct logical-id's is only required to be a subset of the guest-supported identifiers. There's no restriction on list length or on repeating the same logical-id (with possibly different online field). Preferably the input list should describe a modified subset of guest-get-vcpus' return value.

Arguments:

vcpus: array of GuestLogicalProcessor

Not documented

Returns: The length of the initial sublist that has been successfully processed. The guest agent maximizes this value. Possible cases:

- 0: if the vcpus list was empty on input. Guest state has not been changed.
 Otherwise,
- Error: processing the first node of vcpus failed for the reason returned. Guest state has not been changed. Otherwise,
- < length(vcpus): more than zero initial nodes have been processed, but not
 the entire vcpus list. Guest state has changed accordingly. To retrieve the
 error (assuming it persists), repeat the call with the successfully processed initial
 sublist removed. Otherwise,
- length(vcpus): call successful.

Since: 1.5

GuestDiskBusType

[Enum]

An enumeration of bus type of disks

Values:

ide	IDE disks
fdc	floppy disks
scsi	SCSI disks
virtio	virtio disks
xen	Xen disks
usb	USB disks
uml	UML disks
sata	SATA disks
sd	SD cards
unknown	Unknown bus type
ieee1394	Win IEEE 1394 bus type
ssa	Win SSA bus type

fibre Win fiber channel bus type raid Win RAID bus type Win iScsi bus type iscsi Win serial-attaches SCSI bus type sas Win multimedia card (MMC) bus type mmcWin virtual bus type file-backed virtual: Win file-backed bus type virtual file-backed-virtual Not documented Since: 2.2; 'Unknown' and all entries below since 2.4 GuestPCIAddress [Object] Members: domain: int domain id bus id bus: int slot: int slot id function: int function id **Since:** 2.2 GuestDiskAddress [Object] Members: pci-controller: GuestPCIAddress controller's PCI address bus-type: GuestDiskBusType bus type bus: int bus id target: int target id unit: int unit id serial: string (optional) serial number (since: 3.1) dev: string (optional) device node (POSIX) or device UNC (Windows) (since: 3.1) **Since:** 2.2 GuestFilesystemInfo [Object] Members: name: string

disk name

mountpoint: string

mount point path

type: string

file system type string

used-bytes: int (optional)

file system used bytes (since 3.0)

total-bytes: int (optional)

non-root file system total bytes (since 3.0)

disk: array of GuestDiskAddress

an array of disk hardware information that the volume lies on, which may be empty if the disk type is not supported

Since: 2.2

guest-get-fsinfo

[Command]

Returns: The list of filesystems information mounted in the guest. The returned mountpoints may be specified to guest-fsfreeze-freeze-list. Network filesystems (such as CIFS and NFS) are not listed.

Since: 2.2

guest-set-user-password

[Command]

Arguments:

username: string

the user account whose password to change

password: string

the new password entry string, base64 encoded

crypted: boolean

true if password is already crypt()d, false if raw

If the crypted flag is true, it is the caller's responsibility to ensure the correct crypt() encryption scheme is used. This command does not attempt to interpret or report on the encryption scheme. Refer to the documentation of the guest operating system in question to determine what is supported.

Not all guest operating systems will support use of the crypted flag, as they may require the clear-text password

The password parameter must always be base64 encoded before transmission, even if already crypt()d, to ensure it is 8-bit safe when passed as JSON.

Returns: Nothing on success.

Since: 2.3

GuestMemoryBlock

[Object]

Members:

phys-index: int

Arbitrary guest-specific unique identifier of the MEMORY BLOCK.

online: boolean

Whether the MEMORY BLOCK is enabled in guest.

can-offline: boolean (optional)

Whether offlining the MEMORY BLOCK is possible. This member is always filled in by the guest agent when the structure is returned, and always ignored on input (hence it can be omitted then).

Since: 2.3

guest-get-memory-blocks

[Command]

Retrieve the list of the guest's memory blocks.

This is a read-only operation.

Returns: The list of all memory blocks the guest knows about. Each memory block is put on the list exactly once, but their order is unspecified.

Since: 2.3

${\tt GuestMemoryBlockResponseType}$

[Enum]

An enumeration of memory block operation result.

Values:

success the operation of online/offline memory block is successful.

not-found

can't find the corresponding memoryXXX directory in sysfs.

operation-not-supported

for some old kernels, it does not support online or offline memory block.

operation-failed

the operation of online/offline memory block fails, because of some errors happen.

Since: 2.3

GuestMemoryBlockResponse

[Object]

Members:

phys-index: int

same with the 'phys-index' member of GuestMemoryBlock.

response: GuestMemoryBlockResponseType

the result of memory block operation.

error-code: int (optional)

the error number. When memory block operation fails, we assign the value of 'errno' to this member, it indicates what goes wrong. When the operation succeeds, it will be omitted.

guest-set-memory-blocks

[Command]

Attempt to reconfigure (currently: enable/disable) state of memory blocks inside the guest.

The input list is processed node by node in order. In each node phys-index is used to look up the guest MEMORY BLOCK, for which online specifies the requested state. The set of distinct phys-index's is only required to be a subset of the guest-supported identifiers. There's no restriction on list length or on repeating the same phys-index (with possibly different online field). Preferably the input list should describe a modified subset of guest-get-memory-blocks' return value.

Arguments:

mem-blks: array of GuestMemoryBlock

Not documented

Returns: The operation results, it is a list of GuestMemoryBlockResponse, which is corresponding to the input list.

Note: it will return NULL if the mem-blks list was empty on input, or there is an error, and in this case, guest state will not be changed.

Since: 2.3

GuestMemoryBlockInfo

[Object]

Members:

size: int the size (in bytes) of the guest memory blocks, which are the minimal units of memory block online/offline operations (also called Logical Memory Hotplug).

Since: 2.3

guest-get-memory-block-info

[Command]

Get information relating to guest memory blocks.

Returns: GuestMemoryBlockInfo

Since: 2.3

GuestExecStatus

[Object]

Members:

exited: boolean

true if process has already terminated.

exitcode: int (optional)

process exit code if it was normally terminated.

signal: int (optional)

signal number (linux) or unhandled exception code (windows) if the process was abnormally terminated.

out-data: string (optional)

base64-encoded stdout of the process

err-data: string (optional)

base64-encoded stderr of the process Note: out-data and err-data are

present only if 'capture-output' was specified for 'guest-exec'

out-truncated: boolean (optional)

true if stdout was not fully captured due to size limitation.

err-truncated: boolean (optional)

true if stderr was not fully captured due to size limitation.

Since: 2.5

guest-exec-status

[Command]

Check status of process associated with PID retrieved via guest-exec. Reap the process and associated metadata if it has exited.

Arguments:

pid: int pid returned from guest-exec

Returns: GuestExecStatus on success.

Since: 2.5

GuestExec

[Object]

Members:

pid: int pid of child process in guest OS

Since: 2.5

guest-exec

[Command]

Execute a command in the guest

Arguments:

path: string

path or executable name to execute

arg: array of string (optional)

argument list to pass to executable

env: array of string (optional)

environment variables to pass to executable

input-data: string (optional)

data to be passed to process stdin (base64 encoded)

capture-output: boolean (optional)

bool flag to enable capture of stdout/stderr of running process. defaults

to false.

Returns: PID on success.

GuestHostName [Object]

Members:

host-name: string

Fully qualified domain name of the guest OS

Since: 2.10

guest-get-host-name

[Command]

Return a name for the machine.

The returned name is not necessarily a fully-qualified domain name, or even present in DNS or some other name service at all. It need not even be unique on your local network or site, but usually it is.

Returns: the host name of the machine on success

Since: 2.10

GuestUser [Object]

Members:

user: string

Username

domain: string (optional)

Logon domain (windows only)

login-time: number

Time of login of this user on the computer. If multiple instances of the user are logged in, the earliest login time is reported. The value is in fractional seconds since epoch time.

Since: 2.10

guest-get-users

[Command]

Retrieves a list of currently active users on the VM.

Returns: A unique list of users.

Since: 2.10

GuestTimezone [Object]

Members:

zone: string (optional)

Timezone name. These values may differ depending on guest/OS and should only be used for informational purposes.

offset: int

Offset to UTC in seconds, negative numbers for time zones west of GMT, positive numbers for east

Since: 2.10

guest-get-timezone

[Command]

Retrieves the timezone information from the guest.

Returns: A GuestTimezone dictionary.

GuestOSInfo [Object]

Members:

kernel-release: string (optional)

• POSIX: release field returned by uname(2)

• Windows: build number of the OS

kernel-version: string (optional)

• POSIX: version field returned by uname(2)

• Windows: version number of the OS

machine: string (optional)

• POSIX: machine field returned by uname(2)

• Windows: one of x86, x86_64, arm, ia64

id: string (optional)

• POSIX: as defined by os-release(5)

• Windows: contains string "mswindows"

name: string (optional)

• POSIX: as defined by os-release(5)

• Windows: contains string "Microsoft Windows"

pretty-name: string (optional)

• POSIX: as defined by os-release(5)

• Windows: product name, e.g. "Microsoft Windows 10 Enterprise"

version: string (optional)

• POSIX: as defined by os-release(5)

• Windows: long version string, e.g. "Microsoft Windows Server 2008"

version-id: string (optional)

• POSIX: as defined by os-release(5)

• Windows: short version identifier, e.g. "7" or "20012r2"

variant: string (optional)

• POSIX: as defined by os-release(5)

• Windows: contains string "server" or "client"

variant-id: string (optional)

• POSIX: as defined by os-release(5)

• Windows: contains string "server" or "client"

Notes: On POSIX systems the fields id, name, pretty-name, version, version-id, variant and variant-id follow the definition specified in os-release(5). Refer to the manual page for exact description of the fields. Their values are taken from the os-release file. If the file is not present in the system, or the values are not present in the file, the fields are not included.

On Windows the values are filled from information gathered from the system.

 $[{\rm Command}]$

guest-get-osinfo
 Retrieve guest operating system information

Returns: GuestOSInfo

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GuestHostName	QGASeek 5