libqemu-cxx

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Contents

Chapter 1

LIBQEMU-CXX

Libqemu-cxx encapsulates QEMU as a C++ object, such that it can be instanced (for instance) within a SystemC simulation framework.

The libgsutils library does not depend on any library.

Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

Chapter 3

Class Index

3.1 Class List

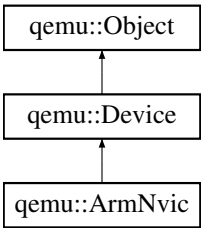
Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 4

Class Documentation

4.1 qemu::ArmNvic Class Reference

Inheritance diagram for qemu::ArmNvic:



Public Member Functions

- **ArmNvic** (const ArmNvic &)=default
- **ArmNvic** (const Object &o)
- void **add_cpu_link** ()

Static Public Attributes

- static constexpr const char ∗const **TYPE** = "armv7m_nvic"

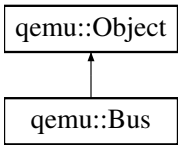
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/aarch64.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/target/aarch64.cc

4.2 qemu::Bus Class Reference

Inheritance diagram for qemu::Bus:



Public Member Functions

- **Bus** (const Bus &o)=default
- **Bus** (const Object &o)

Static Public Attributes

- static constexpr const char ∗const **TYPE** = "bus"

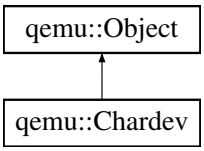
Additional Inherited Members

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h

4.3 qemu::Chardev Class Reference

Inheritance diagram for qemu::Chardev:



Public Member Functions

- **Chardev** (const Chardev &o)=default
- **Chardev** (const Object &o)

Static Public Attributes

- static constexpr const char ∗const **TYPE** = "chardev"

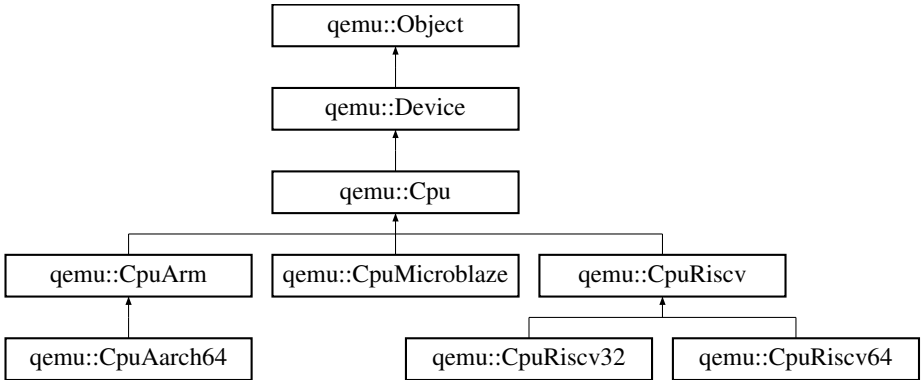
Additional Inherited Members

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h

4.4 qemu::Cpu Class Reference

Inheritance diagram for qemu::Cpu:



Public Types

- using **EndOfLoopCallbackFn** = std::function< void()>
- using **CpuKickCallbackFn** = std::function< void()>
- typedef void(* **AsyncJobFn**) (void *)

Public Member Functions

- **Cpu** (const Cpu &)=default
- **Cpu** (const Object &o)
- void **loop** ()
- bool **loop_is_busy** ()
- bool **can_run** ()
- void **set_soft_stopped** (bool stopped)
- void **halt** (bool halted)
- void **reset** ()
- void **set_unplug** (bool unplug)
- void **remove_sync** ()
- void **register_thread** ()
- Cpu **set_as_current** ()
- void **kick** ()
- void **async_safe_run** (AsyncJobFn job, void *arg)
- void **set_end_of_loop_callback** (EndOfLoopCallbackFn cb)
- void **set_kick_callback** (CpuKickCallbackFn cb)

Static Public Attributes

- static constexpr const char *const **TYPE** = "cpu"

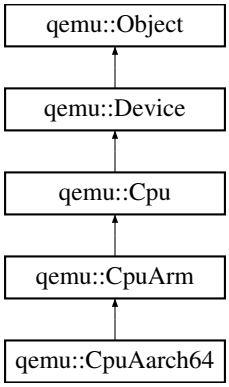
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/cpu.cc

4.5 qemu::CpuAarch64 Class Reference

Inheritance diagram for qemu::CpuAarch64:



Public Member Functions

- **CpuAarch64** (const CpuAarch64 &)=default
- **CpuAarch64** (const Object &o)
- void **set_aarch64_mode** (bool aarch64_mode)

Static Public Attributes

- static constexpr const char *const **TYPE** = "arm-cpu"

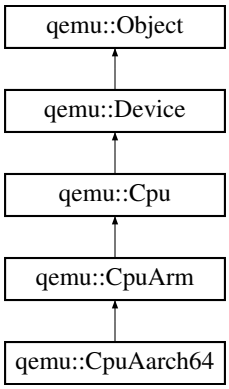
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/aarch64.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/target/aarch64.cc

4.6 qemu::CpuArm Class Reference

Inheritance diagram for qemu::CpuArm:



Public Member Functions

- **CpuArm** (const CpuArm &)=default
- **CpuArm** (const Object &o)
- void **set_cp15_cbar** (uint64_t cbar)
- void **add_nvic_link** ()
- uint64_t **get_exclusive_val** ()

Static Public Attributes

- static constexpr const char ∗const **TYPE** = "arm-cpu"

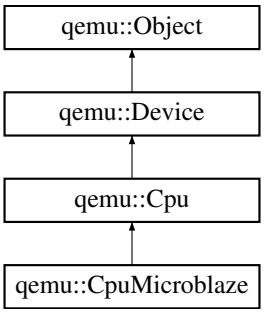
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/aarch64.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/target/aarch64.cc

4.7 qemu::CpuMicroblaze Class Reference

Inheritance diagram for qemu::CpuMicroblaze:



Public Member Functions

- **CpuMicroblaze** (const CpuMicroblaze &)=default
- **CpuMicroblaze** (const Object &o)

Static Public Attributes

- static constexpr const char *const **TYPE** = "microblaze-cpu"

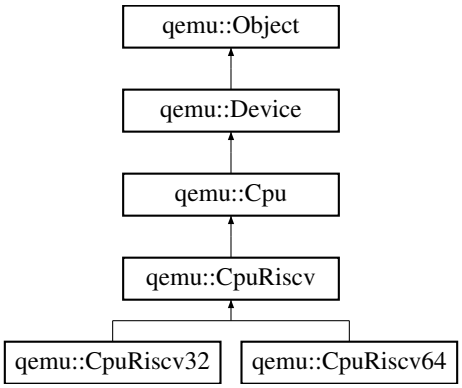
Additional Inherited Members

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/microblaze.h

4.8 qemu::CpuRiscv Class Reference

Inheritance diagram for qemu::CpuRiscv:



Public Types

- using **MipUpdateCallbackFn** = std::function< void(uint32_t)>

Public Member Functions

- **CpuRiscv** (const CpuRiscv &)=default
- **CpuRiscv** (const Object &o)
- void **set_mip_update_callback** (MipUpdateCallbackFn cb)

Static Public Attributes

- static constexpr const char *const **TYPE** = "riscv-cpu"

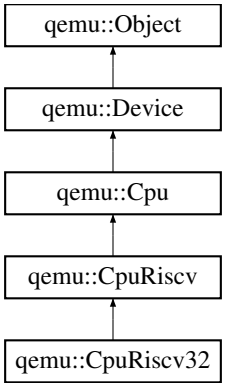
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/riscv.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/target/riscv.cc

4.9 qemu::CpuRiscv32 Class Reference

Inheritance diagram for qemu::CpuRiscv32:



Public Member Functions

- **CpuRiscv32** (const CpuRiscv32 &)=default
- **CpuRiscv32** (const Object &o)

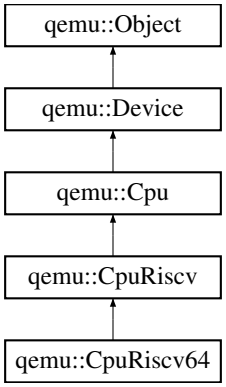
Additional Inherited Members

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/riscv.h

4.10 qemu::CpuRiscv64 Class Reference

Inheritance diagram for qemu::CpuRiscv64:



Public Member Functions

- **CpuRiscv64** (const CpuRiscv64 &)=default
- **CpuRiscv64** (const Object &o)

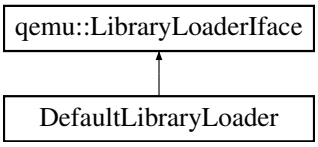
Additional Inherited Members

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/target/riscv.h

4.11 DefaultLibraryLoader Class Reference

Inheritance diagram for DefaultLibraryLoader:



Public Member Functions

- qemu::LibraryLoaderIface::LibraryIfacePtr **load_library** (const char *lib_name)
- const char * **get_lib_ext** ()
- const char * **get_last_error** ()

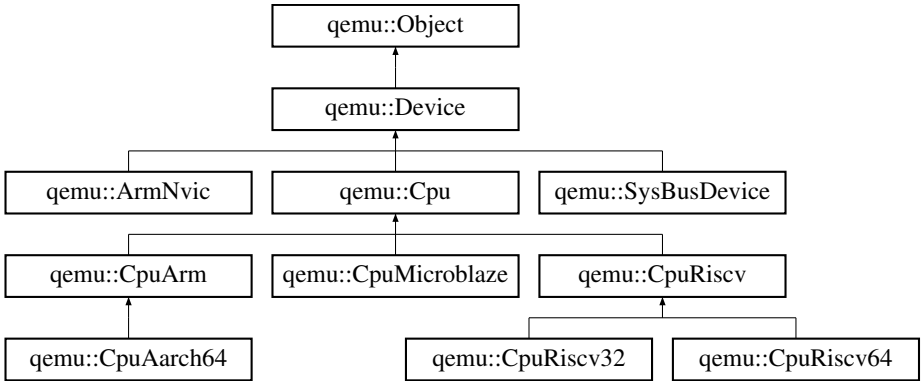
Additional Inherited Members

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/loader.cc

4.12 qemu::Device Class Reference

Inheritance diagram for qemu::Device:



Public Member Functions

- **Device** (const Device &)=default
- **Device** (const Object &o)
- void **connect_gpio_out** (int idx, Gpio gpio)
- void **connect_gpio_out_named** (const char *name, int idx, Gpio gpio)
- Gpio **get_gpio_in** (int idx)
- Gpio **get_gpio_in_named** (const char *name, int idx)
- Bus **get_child_bus** (const char *name)
- void **set_parent_bus** (Bus bus)
- void **set_prop_chardev** (const char *name, Chardev chr)

Static Public Attributes

- static constexpr const char *const **TYPE** = "device"

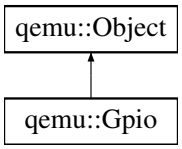
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/device.cc

4.13 qemu::Gpio Class Reference

Inheritance diagram for qemu::Gpio:



Classes

- class GpioProxy

Public Types

- typedef std::function< void(bool)> **GpioEventFn**

Public Member Functions

- **Gpio** (const Gpio &o)=default
- **Gpio** (const Object &o)
- void **set** (bool lvl)
- void **set_proxy** (std::shared_ptr< GpioProxy > proxy)
- void **set_event_callback** (GpioEventFn cb)

Static Public Attributes

- static constexpr const char ∗const **TYPE** = "irq"

Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/gpio.cc

4.14 qemu::Gpio::GpioProxy Class Reference

Public Member Functions

- void **event** (bool level)
- void **set_callback** (GpioEventFn cb)

Protected Attributes

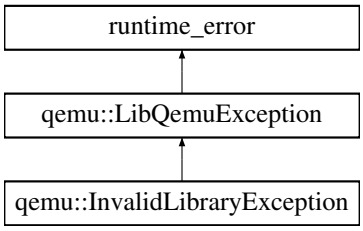
- bool **m_prev_valid** = false
- bool **m_prev**
- GpioEventFn **m_cb**

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h

4.15 qemu::InvalidLibraryException Class Reference

Inheritance diagram for qemu::InvalidLibraryException:



Public Member Functions

- **InvalidLibraryException** (const char ∗lib_name, const char ∗symbol)

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/exceptions.h

4.16 qemu::LibQemu Class Reference

Public Member Functions

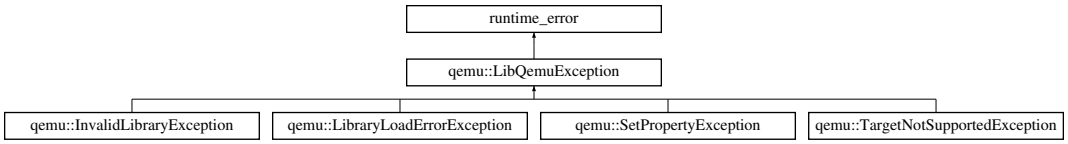
- **LibQemu** (LibraryLoaderIface &library_loader, const char *lib_path)
- **LibQemu** (LibraryLoaderIface &library_loader, Target t)
- void **push_qemu_arg** (const char *arg)
- void **push_qemu_arg** (std::initializer_list< const char *> args)
- const std::vector< char * > & **get_qemu_args** () const
- void **init** ()
- bool **is_inited** () const
- void **start_gdb_server** (std::string port)
- void **lock_iothread** ()
- void **unlock_iothread** ()
- void **coroutine_yield** ()
- template<class T >
  T **object_new** ()
- int64_t **get_virtual_clock** ()
- Object **object_new** (const char *type_name)
- std::shared_ptr< MemoryRegionOps > **memory_region_ops_new** ()
- Gpio **gpio_new** ()
- std::shared_ptr< Timer > **timer_new** ()
- Chardev **chardev_new** (const char *label, const char *type)
- void **tb_invalidate_phys_range** (uint64_t start, uint64_t end)

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/callbacks.cc
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/libqemu-cxx.cc

4.17 qemu::LibQemuException Class Reference

Inheritance diagram for qemu::LibQemuException:



Public Member Functions

- **LibQemuException** (const char *what)
- **LibQemuException** (const std::string &what)

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/exceptions.h

4.18 qemu::LibQemuInternals Class Reference

Public Member Functions

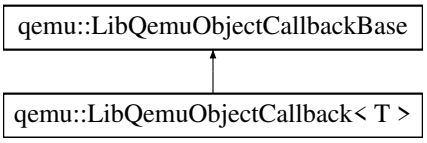
- **LibQemuInternals** (LibQemu &inst, LibQemuExports ∗exports)
- const LibQemuExports & **exports** () const
- LibQemu & **get_inst** ()
- void **clear_callbacks** (Object obj)
- LibQemuObjectCallback< Cpu::EndOfLoopCallbackFn > & **get_cpu_end_of_loop_cb** ()
- LibQemuObjectCallback< Cpu::CpuKickCallbackFn > & **get_cpu_kick_cb** ()
- LibQemuObjectCallback< CpuRiscv64::MipUpdateCallbackFn > & **get_cpu_riscv_mip_update_cb** ()

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/internals.h

4.19 qemu::LibQemuObjectCallback< T > Class Template Reference

Inheritance diagram for qemu::LibQemuObjectCallback< T >:



Public Member Functions

- void **register_cb** (Object obj, T cb)
- void **clear** (Object obj)
- template<typename... Args>
  void **call** (QemuObject ∗obj, Args... args) const

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/internals.h

4.20 qemu::LibQemuObjectCallbackBase Class Reference

Inheritance diagram for qemu::LibQemuObjectCallbackBase:

Public Member Functions

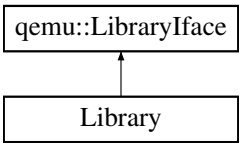
- virtual void **clear** (Object obj)=0

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/internals.h

4.21 Library Class Reference

Inheritance diagram for Library:



Public Member Functions

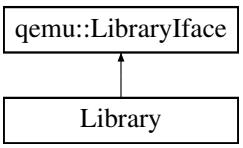
- **Library** (void ∗lib)
- bool **symbol_exists** (const char ∗name)
- void ∗ **get_symbol** (const char ∗name)

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/loader.cc

4.22 qemu::LibraryIface Class Reference

Inheritance diagram for qemu::LibraryIface:



Public Member Functions

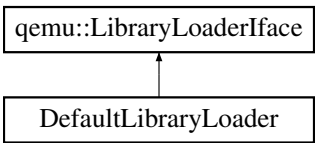
- virtual bool **symbol_exists** (const char ∗symbol)=0
- virtual void ∗ **get_symbol** (const char ∗symbol)=0

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/loader.h

4.23 qemu::LibraryLoaderIface Class Reference

Inheritance diagram for qemu::LibraryLoaderIface:



Public Types

- using **LibraryIfacePtr** = std::shared_ptr< LibraryIface >

Public Member Functions

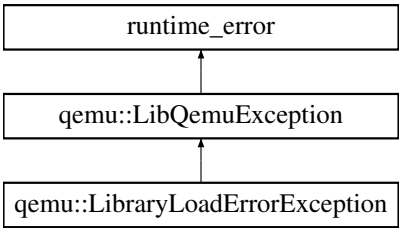
- virtual LibraryIfacePtr **load_library** (const char *lib_name)=0
- virtual const char * **get_lib_ext** ()=0
- virtual const char * **get_last_error** ()=0

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/loader.h

4.24 qemu::LibraryLoadErrorException Class Reference

Inheritance diagram for qemu::LibraryLoadErrorException:



Public Member Functions

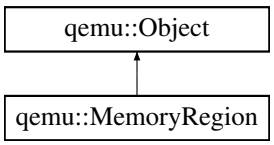
- **LibraryLoadErrorException** (const char *lib_name, const char *error)

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/exceptions.h

4.25 qemu::MemoryRegion Class Reference

Inheritance diagram for qemu::MemoryRegion:



Public Types

- using **MemTxResult** = MemoryRegionOps::MemTxResult
- using **MemTxAttrs** = MemoryRegionOps::MemTxAttrs

Public Member Functions

- **MemoryRegion** (const MemoryRegion &)=default
- **MemoryRegion** (const Object &o)
- uint64_t **get_size** ()
- void **init_io** (Object owner, const char ∗name, uint64_t size, MemoryRegionOpsPtr ops)
- void **init_ram_ptr** (Object owner, const char ∗name, uint64_t size, void ∗ptr)
- void **init_alias** (Object owner, const char ∗name, const MemoryRegion &root, uint64_t offset, uint64_t size)
- void **add_subregion** (MemoryRegion &mr, uint64_t offset)
- void **del_subregion** (const MemoryRegion &mr)
- MemTxResult **dispatch_read** (uint64_t addr, uint64_t ∗data, uint64_t size, MemTxAttrs attrs)
- MemTxResult **dispatch_write** (uint64_t addr, uint64_t data, uint64_t size, MemTxAttrs attrs)
- bool **operator**< (const MemoryRegion &mr) const

Public Attributes

- MemoryRegion ∗ **container**

Static Public Attributes

- static constexpr const char ∗const **TYPE** = "qemu:memory-region"

Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/memory.cc

4.26 qemu::MemoryRegionOps Class Reference

Classes

- struct MemTxAttrs

Public Types

- enum **MemTxResult** { **MemTxOK**, **MemTxError**, **MemTxDecodeError**, **MemTxOKExitTB** }
- typedef std::function< MemTxResult(uint64_t, uint64_t *, unsigned int, MemTxAttrs)> **ReadCallback**
- typedef std::function< MemTxResult(uint64_t, uint64_t, unsigned int, MemTxAttrs)> **WriteCallback**

Public Member Functions

- **MemoryRegionOps** (QemuMemoryRegionOps *ops, std::shared_ptr< LibQemuInternals > internals)
- void **set_read_callback** (ReadCallback cb)
- void **set_write_callback** (WriteCallback cb)
- void **set_max_access_size** (unsigned size)
- ReadCallback **get_read_callback** ()
- WriteCallback **get_write_callback** ()
- QemuMemoryRegionOps * **get_qemu_mr_ops** ()

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/memory.cc

4.27 qemu::MemoryRegionOps::MemTxAttrs Struct Reference

Public Member Functions

- **MemTxAttrs** (const ::MemTxAttrs &qemu_attrs)

Public Attributes

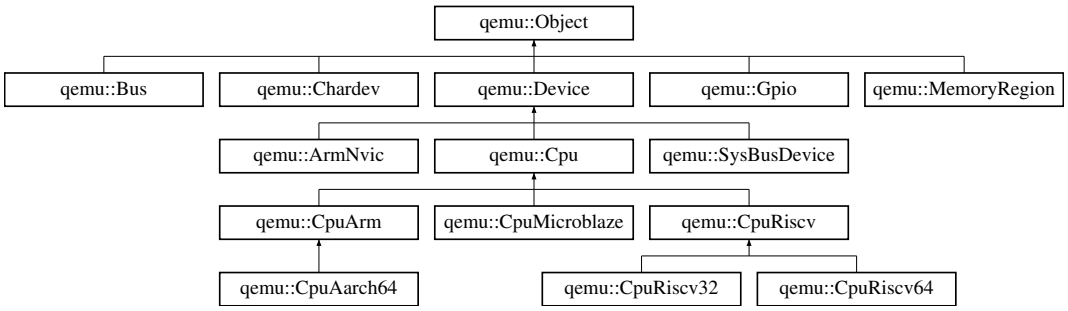
- bool **secure** = false
- bool **exclusive** = false
- bool **debug** = false

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/memory.cc

4.28 qemu::Object Class Reference

Inheritance diagram for qemu::Object:



Public Member Functions

- **Object** (QemuObject ∗obj, std::shared_ptr< LibQemuInternals > &internals)
- **Object** (const Object &o)
- **Object** (Object &&o)
- Object & **operator=** (Object o)
- bool **valid** () const
- void **set_prop_bool** (const char ∗name, bool val)
- void **set_prop_int** (const char ∗name, int64_t val)
- void **set_prop_str** (const char ∗name, const char ∗val)
- void **set_prop_link** (const char ∗name, const Object &link)
- QemuObject ∗ **get_qemu_obj** ()
- LibQemu & **get_inst** ()
- uintptr_t **get_inst_id** () const
- bool **same_inst_as** (const Object &o) const
- template<class T >
  bool **check_cast** () const
- void **clear_callbacks** ()

Protected Member Functions

- bool **check_cast_by_type** (const char ∗type_name) const

Protected Attributes

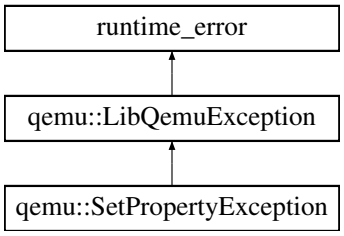
- QemuObject ∗ **m_obj** = nullptr
- std::shared_ptr< LibQemuInternals > **m_int**

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/object.cc

4.29 qemu::SetPropertyException Class Reference

Inheritance diagram for qemu::SetPropertyException:



Public Member Functions

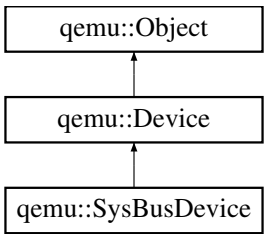
- **SetPropertyException** (const char *type, const char *name)

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/exceptions.h

4.30 qemu::SysBusDevice Class Reference

Inheritance diagram for qemu::SysBusDevice:



Public Member Functions

- **SysBusDevice** (const SysBusDevice &)=default
- **SysBusDevice** (const Object &o)
- MemoryRegion **mmio_get_region** (int id)
- void **connect_gpio_out** (int idx, Gpio gpio)

Static Public Attributes

- static constexpr const char *const **TYPE** = "sys-bus-device"

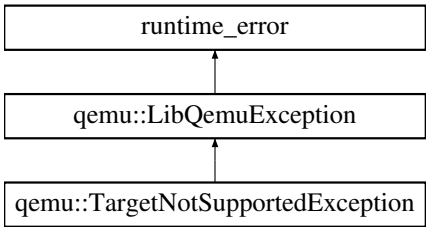
Additional Inherited Members

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/sysbus.cc

4.31 qemu::TargetNotSupportedException Class Reference

Inheritance diagram for qemu::TargetNotSupportedException:



Public Member Functions

- **TargetNotSupportedException** (Target t)

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

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/exceptions.h

4.32 qemu::Timer Class Reference

Public Types

- typedef std::function< void()> **TimerCallbackFn**

Public Member Functions

- **Timer** (std::shared_ptr< LibQemuInternals > internals)
- void **set_callback** (TimerCallbackFn cb)
- void **mod** (int64_t deadline)
- void **del** ()

The documentation for this class was generated from the following files:

- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/include/libqemu-cxx/libqemu-cxx.h
- /home/thomas/Documents/GreenSocs/build-lib/libqemu-cxx/src/timer.cc

Index