

vxgcloudagent

1.3.0

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## Chapter 1

# VXG Cloud Agent Library

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## Chapter 2

# Build System

### 2.0.1 Overview

VXG Cloud Agent library uses [Meson](#) build system as a modern, fast and flexible build system that supports easy to set up and maintain a cross-compilation process.

It's recommended to refer to the [Meson](#) guide.

### 2.0.2 C++ Toolchain Requirements

**IMPORTANT: This projects requires C++ toolchain with C++11 support**

VXG Cloud Agent Library requires modern C++11 so in order to build and use this library the user needs a compiler with C++11 support.

GCC [supports](#) C++11 since version 4.8.1 released on May 31, 2013.

#### C++11 Support in GCC

GCC 4.8.1 was the first feature-complete implementation of the 2011 C++ standard, previously known as C++0x.

This mode can be selected with the `-std=c++11` command-line flag, or `-std=gnu++11` to enable GNU extensions as well.

### 2.0.3 Build system installation

**IMPORTANT: This projects requires Meson version `>= 0.56.0`**

It's recommended to use [Ubuntu 20.04 LTS](#) distribution in development process but other distributions or operation systems are also supported by [Meson](#).

Please refer to [Meson installation guide](#) to get and install Meson, preferable way to install Meson is `pip` method.

Quick install guide for Ubuntu 20.04. If you have an old version of meson already installed please remove it first.

```
sudo apt-get update
sudo apt-get install -y python3-pip git ninja-build curl tzdata python3-tz
pip3 install git+https://github.com/mesonbuild/meson@0.56.0
# pip3 puts meson main script into the $HOME/.local/bin/ directory, you need to
# add $HOME/.local/bin/ into your PATH environment variable, for bash shell you
# can run the following command and restart the shell session.
echo 'export PATH=$HOME/.local/bin:$PATH' » $HOME/.bashrc
# Check currently installed meson version
meson -v
```



## Chapter 3

# Application Development

### 3.1 Overview

An application that uses VXG Cloud Agent Library should implement 3 classes derived from the base classes provided by the library:

- `agent::callback` - common callbacks class, only `on_bye` callback is mandatory for implementation
- `agent::media::stream` class, abstract class for media streams, library provides basic `media::rtsp_stream` implementation which retransmits RTSP source stream to the endpoint of the VXG Cloud, all callbacks are stubbed. Developer normally should implement own class derived from the `media::stream` with own `vvg::media::Streamer::ISource` implementation(`vvg::media::ffmpeg::Source` class implementation from the `ffmpeg_source.cc` can be used as a reference), or if RTSP source is acceptable developer can implement own class derived from the `media::rtsp_stream` but with callbacks implemented.
- `agent::event_stream` class, abstract class for events generation.

Any callback implementation as well as `ISource::init` and `ISource::finit` implementations should be non-blocking, VXG Cloud messages processing is single-threaded which means any VXG Cloud messages are handled sequentially hence no new message will be processed until the callback triggered by the previous message is returned.

The library provides the stub implementation for most of the virtual methods of these classes, the stub implementation prints a log message about this method is not implemented and returns an error, the final application should implement all virtual methods on its own.

Most of the callbacks are just getter/setter for the library's `objects`.

### 3.2 Examples

#### 3.2.1 Minimal application example

Headers and namespaces:

```
#include <agent/manager.h>
#include <agent/rtsp-stream.h>
#include <utils/logging.h>
#include <utils/properties.h>
using namespace vvg::cloud;
using namespace vvg::cloud::agent;
```

Common callbacks class, minimal implementation derived from the `agent::callback` class:

```
using namespace vxg::cloud;
class agent_callback_minimal : public agent::callback {
public:
    virtual void on_bye(proto::bye_reason reason) override {
        vxg::logger::warn("Connection close {}", json(reason).dump());
    }
    virtual void on_registered(const std::string& sid) override {
        // Save Cloud registration session id in the local properties file.
        // This is required for the fast reconnection to the Cloud.
        props.set("prev_sid", sid);
    }
};
```

Create and start agent object `agent::manager` with one basic media stream `agent::media::rtsp_stream`

```
using namespace vxg::cloud::agent;
// Agent
manager::ptr agent;
// VXG Cloud token
auto access_token =
    proto::access_token::parse(vxg_cloud_token);
// Agent callback
callback::ptr cb = std::make_unique<agent_callback_minimal>();
// Media stream
std::vector<agent::media::stream::ptr> streams;
media::stream::ptr stream =
    std::make_shared<media::rtsp_stream>(rtsp_url, "DemoStream");
streams.push_back(stream);
// Create agent
if ((agent = agent::manager::create(agent_config, std::move(cb),
                                     access_token, streams)) == nullptr) {
    vxg::logger::error("Failed to create agent");
    return EXIT_FAILURE;
}
if (!quit && !agent->start())
    quit = true;
```

Complete minimal example:

```
#include <signal.h>
#include <args.hxx>
#include <agent/manager.h>
#include <agent/rtsp-stream.h>
#include <utils/logging.h>
#include <utils/properties.h>
using namespace vxg::cloud;
using namespace vxg::cloud::agent;
agent::config agent_config;
static bool quit = 0;
static vxg::properties props;
#ifdef _WIN32
static void signal_handler(int sig) {
    if (sig == SIGINT || sig == SIGTERM) {
        fprintf(stderr, "\nSIGTERM received\n\n");
        quit = true;
    }
}
#endif
using namespace vxg::cloud;
class agent_callback_minimal : public agent::callback {
public:
    virtual void on_bye(proto::bye_reason reason) override {
        vxg::logger::warn("Connection close {}", json(reason).dump());
    }
    virtual void on_registered(const std::string& sid) override {
        // Save Cloud registration session id in the local properties file.
        // This is required for the fast reconnection to the Cloud.
        props.set("prev_sid", sid);
    }
};
std::string vxg_cloud_token;
std::string rtsp_url;
bool parse_args(int argc, char** argv) {
    args::ArgumentParser parser("This is a test program.", "");
    args::HelpFlag help(parser, "help", "Display this help menu",
                        {'h', "help"});
    args::CompletionFlag completion(parser, {"complete"});
    args::Positional<std::string> token(parser, "vxg_cloud_token",
                                         "VXG Cloud Access Token", "",
                                         args::Options::Required);
    args::Positional<std::string> url(parser, "rtsp_url", "RTSP stream url", "",
                                     args::Options::Required);
    args::Flag secure_connection_arg(
        parser, "",
        "Use secure cloud connection(enables encryption, cloud agent library "
        "must be compiled with openssl support enabled)",
```

```

    {"secure-channel", 's'});
try {
    parser.ParseCLI(argc, argv);
    vxg_cloud_token = args::get(token);
    rtsp_url = args::get(url);
    agent_config.insecure_cloud_channel =
        !args::get(secure_connection_arg);
} catch (const args::RequiredError& e) {
    std::cout << e.what() << std::endl;
    return false;
} catch (const args::Completion& e) {
    std::cout << e.what();
    return false;
} catch (const args::Help&) {
    std::cout << parser;
    return false;
} catch (const args::ParseError& e) {
    std::cerr << e.what() << std::endl;
    std::cerr << parser;
    return false;
}
return true;
}

int main(int argc, char** argv) {
    vxg::properties::reset("agent-test.props");
    // Try to load and set previously saved session id.
    // This is required for the fast reconnection to the Cloud.
    if (!props.get("prev_sid").empty())
        agent_config.cm_registration_sid = props.get("prev_sid");
    // Parse args and retrieve token and rtsp url
    if (!parse_args(argc, argv))
        return EXIT_FAILURE;
#ifdef _WIN32
    // Catch signal
    signal(SIGINT, signal_handler);
    signal(SIGTERM, signal_handler);
    signal(SIGPIPE, SIG_IGN);
#endif
    vxg::logger::info("VXG Cloud Agent Library Version: {}",
        vxg::cloud::agent::version());
    using namespace vxg::cloud::agent;
    // Agent
    manager::ptr agent;
    // VXG Cloud token
    auto access_token =
        proto::access_token::parse(vxg_cloud_token);
    // Agent callback
    callback::ptr cb = std::make_unique<agent_callback_minimal>();
    // Media stream
    std::vector<agent::media::stream::ptr> streams;
    media::stream::ptr stream =
        std::make_shared<media::rtsp_stream>(rtsp_url, "DemoStream");
    streams.push_back(stream);
    // Create agent
    if ((agent = agent::manager::create(agent_config, std::move(cb),
        access_token, streams)) == nullptr) {
        vxg::logger::error("Failed to create agent");
        return EXIT_FAILURE;
    }
    if (!quit && !agent->start())
        quit = true;
    // Spin main thread until stopped
    while (!quit) {
        std::this_thread::sleep_for(std::chrono::seconds(1));
    }
    agent->stop();
    agent = nullptr;
    vxg::logger::info("Agent stopped");
    return EXIT_SUCCESS;
}

```

### 3.2.2 Complete application example

**Common callback class:** derived from [agent::callback](#)

```

using namespace vxg::cloud;
class my_agent_callback : public agent::callback {
public:
    virtual void on_bye(proto::bye_reason reason) override {
        vxg::logger::error("Error {}", json(reason).dump());
    }
    virtual bool on_raw_msg(std::string client_id, std::string& data) override {
        vxg::logger::info("Raw message {} from client '{}'", data, client_id);
    }
}

```

```

    // Reply json
    data = "{\"reply\": \"OK\"}";
    return true;
}
virtual bool on_get_log(std::string& log_data) override {
    log_data = "log messages...";
    vxg::logger::warn("{} not implemented", __func__);
    return true;
}
virtual bool on_start_backward_audio(std::string url) override {
    // Start backward audio playback from url
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_stop_backward_audio(std::string url) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_cam_video_config(proto::video_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_cam_video_config(
    const proto::video_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_cam_audio_config(proto::audio_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_cam_audio_config(
    const proto::audio_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_ptz_config(proto::ptz_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_cam_ptz(proto::ptz_command& command) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_osd_config(proto::osd_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_osd_config(const proto::osd_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_wifi_config(proto::wifi_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_wifi_config(
    const proto::wifi_network& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_motion_detection_config(
    proto::motion_detection_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_motion_detection_config(
    const proto::motion_detection_config& config) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_timezone(std::string& timezone) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_timezone(std::string timezone) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_get_memorycard_info(
    proto::event_object::memorycard_info_object& info) override {
    vxg::logger::warn("{} not implemented", __func__);
    return false;
}
virtual bool on_set_audio_detection(
    const proto::audio_detection_config& conf) {
    vxg::logger::warn("{} not implemented", __func__);
}

```

```

        return false;
    }
    virtual bool on_get_audio_detection(proto::audio_detection_config& conf) {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
};

```

#### Media stream callback class: derived from `agent::media::stream`

```

class my_media_stream : public media::rtsp_stream {
public:
    my_media_stream(std::string url, std::string name)
        : media::rtsp_stream(url, name) {}
    bool get_supported_stream(proto::supported_stream_config& config) override {
        vxg::logger::warn("{} default implementation should be overridden",
            __func__);
        config.id = cloud_name();
        config.video = "Video" + std::to_string(0);
        // config.audio = "Audio" + std::to_string(0);
        return true;
    }
    virtual bool get_stream_caps(proto::stream_caps& caps) override {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual bool get_stream_config(
        proto::stream_config& streamConfig) override {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual bool set_stream_config(
        const proto::stream_config& streamConfig) override {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual bool get_snapshot(
        proto::event_object::snapshot_info_object& snapshot) override {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual std::vector<proto::video_clip_info> record_get_list(
        vxg::cloud::time begin,
        vxg::cloud::time end,
        bool align) override {
        std::vector<proto::video_clip_info> empty_vector(0);
        vxg::logger::warn("{} not implemented", __func__);
        return empty_vector;
    }
    virtual proto::video_clip_info record_export(
        vxg::cloud::time begin,
        vxg::cloud::time end) override {
        proto::video_clip_info clip;
        vxg::logger::warn("{} not implemented", __func__);
        // empty clip
        return clip;
    }
    virtual bool start_record() override {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual bool stop_record() override {
        vxg::logger::warn("{} not implemented", __func__);
        return true;
    }
};

```

#### Event stream callback class: derived from `agent::media::event_stream`

```

class my_event_stream : public agent::event_stream {
public:
    my_event_stream(std::string name) : agent::event_stream(name) {}
    virtual bool start() {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual void stop() { vxg::logger::warn("{} not implemented", __func__); }
    virtual bool init() {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual void finit() { vxg::logger::warn("{} not implemented", __func__); }
    virtual bool set_trigger_recording(bool enabled, int pre, int post) {
        vxg::logger::warn("{} not implemented", __func__);
        return false;
    }
    virtual bool get_events(std::vector<proto::event_config>& configs) {

```

```

        return false;
    }
    virtual bool set_events(const std::vector<proto::event_config>& config) {
        return false;
    }
};

```

### Creating and start agent instance with all callbacks:

```

using namespace vxg::cloud::agent;
// Agent
manager::ptr agent;
// VXG Cloud token
auto access_token = proto::access_token::parse(vxg_cloud_token);
// Agent callback
callback::ptr cb = std::make_unique<my_agent_callback>();
// Media stream
std::vector<agent::media::stream::ptr> streams;
media::stream::ptr stream =
    std::make_shared<my_media_stream>(rtsp_url, "MyMediaStream");
streams.push_back(stream);
// Event stream
std::vector<agent::event_stream::ptr> event_streams;
event_stream::ptr event_stream =
    std::make_shared<my_event_stream>("MyEventStream");
event_streams.push_back(event_stream);
// Create agent
if ((agent =
    agent::manager::create(agent_config, std::move(cb), access_token,
        streams, event_streams)) == nullptr) {
    vxg::logger::error("Failed to create agent");
    return EXIT_FAILURE;
}
if (!quit && !agent->start())
    quit = true;

```

## 3.2.3 Linking application against the VXG Agent Cloud Library

There are 3 possible ways of how to build and link your application

1. Building the application inside the VXG CCloud Agent library's Meson project, the app will be assembled during the library project compilation in this case.

You need to add a new executable target into the main `meson.build` file, please refer to the example app build target declaration:

```

cloud_agent_minimal = executable('cloud-agent-minimal', 'src/cloud-agent-minimal.cc',
    install : true, dependencies: dep)

```

User must declare own executable target with a list of sources and dependencies, user may need to declare own dependencies if application requires it.

**This method is not recommended as it makes updating of the VXG Cloud Agent library mostly not possible or very difficult for application developer**

2. Building your app using your own build system and linking against the installed library.  
Running the `install` step from the `compile` section installs the binary libraries and headers into the directory you specified during the `setup` step, it also puts the `pkg-config's .pc` files into the prefix directory which could be used by your own build system.
3. Preferred and recommended way of application development is to hold the app as a separate Meson project and use the VXG Cloud Agent library as a Meson subproject of the application's Meson project.

Using this approach gives the most flexible and convenient workflow for updating the VXG Cloud Library, all library dependencies will be promoted to the main project and will be also accessible by the application.

#### How does it work

- Assuming you have a Meson build system [installed](#)
- Start a new Meson project with a following command:  

```
meson init -l cpp -n your-project-name
```



- As a result of this command you should have the following files tree:  

```
|-- meson.build
|-- your_project_name.cpp
```
- Add VXG Cloud Agent library as a Meson subproject  
All subprojects should be located in the subprojects directory so you have to create it first  

```
mkdir subprojects
```

Now you have 2 options depending on how you want to store the VXG Cloud Agent library sources:

(a) If you want to store the VXG Cloud Agent library as a files tree locally.

- Create a symlink to the library path inside the subprojects dir:  

```
ln -s path/to/vxgcloudagent subprojects/vxgcloudagent
```

Or you can just move vxgcloudagent directory inside the subprojects dir.

- Create a library's Meson wrap file inside the subprojects dir, the name of the file should be the same as symlink you created in 1.1 and the content of the file should be:

```
[wrap-file]
directory = vxgcloudagent
[provide]
vxgcloudagent = vxgcloudagent_dep
```

(b) If you want to store the library in a git repository you just need to create a wrap file with the content like below:

```
[wrap-git]
url=https://your-git-repo-url.com/path/vxgcloudagent.git
# You can specify tag, branch or commit hash as revision
revision=master
[provide]
vxgcloudagent = vxgcloudagent_dep
```

You can find the example app Meson project in the example/app directory of the VXG Cloud library sources package.



## Chapter 4

# Library Compilation Guide

### 4.0.1 Library build process

Here is a compilation quickstart guide:

- First of all you need to have a build system and toolchain [installed](#)
- **Setup the build directory**  

```
meson setup --prefix=path/to/install --strip -Dbuildtype=debug builddir/  
# --prefix=path specifies the installation path  
# --strip indicates that final binaries should be stripped  
# -Dbuildtype= specifies the debug/release build type, please check the Meson docs about full list of  
the build types.
```

- **Build**  

```
meson compile -C builddir  
# Or  
ninja -C builddir
```

- **Install**  

```
meson install -C builddir  
# Or  
ninja -C builddir/ install
```

As a result of the `install` step you should have the library compiled and installed into the prefix directory you specified during the `setup` step.

- **Clean**  

```
ninja -C builddir clean
```

Or you can just delete the `builddir`, you will need to `setup` it again in this case.  

```
rm -rf builddir
```

### 4.0.2 Cross-compilation

- By default `Meson` builds project for the host platform, but it's also possible to cross-compile the library and your application using `Meson`.
- Full `Meson` cross-compilation documentation can be found [here](#).

- The difference between the host compilation described above and the cross-compilation is the additional `--cross-file=path/to/cross-file.txt` flag for the Meson Setup step, the Setup command should look like below:

```
meson setup --prefix=path/to/install --strip -Dbuildtype=debug --cross-file=path/to/cross-file.txt  
builddir/
```

`cross-file.txt` is the target platform description which in terms of Meson called a `cross-file`.

- cross-file example below is for the Debian provided arm-linux-gnueabihf toolchain installable using the Ubuntu's package manager command  
`sudo apt install g++-arm-linux-gnueabihf`

- Example of the ARMv7 cross-file:

```
[host_machine]
system = 'linux'
cpu_family = 'arm'
cpu = 'armv7-a'
endian = 'little'
[built-in options]
# Example of platform specific CFLAGS and CXXFLAGS
c_args = ['-mfloat-abi=hard', '-march=armv7-a+vfpu3']
cpp_args = c_args
default_library = 'static'
[properties]
# If your toolchain requires specifying the sysroot dir you can setup it like below, sysroot_dir is a
# constant declared in [constants] section of the cross-file
#sys_root = sysroot_dir
# Meson uses pkg-config and cmake to detect external dependencies
# Set the correct path to your cross-compilation pkgconfig directory if your app depends on some
# external dependencies like platform specific libs.
#pkg_config_libdir = sysroot_dir / 'usr/lib/pkgconfig/'
[constants]
cross_prefix = 'arm-linux-gnueabihf-'
#sysroot_dir = '/opt/arm-linux-gnueabihf/sysroot/'
[binaries]
c = cross_prefix + 'gcc'
cpp = cross_prefix + 'g++'
ar = cross_prefix + 'ar'
strip = cross_prefix + 'strip'
# You should specify your platform toolchain pkg-config binary here
#pkgconfig = '/opt/arm-linux-gnueabihf/bin/pkg-config'
```

## Chapter 5

# Deprecated List

Global `vxg::logger::reset` (int argc, char \*\*argv, loglevel l, std::string syslog\_ident="VXGCloudAgent↵  
Default", std::string crash\_logfile\_path="", std::string logfile\_path="", size\_t logfile\_max\_size=(1024  
\*1024), size\_t logfile\_max\_files=3)

Use `reset(const options& opts)`



## Chapter 6

# Hierarchical Index

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## Chapter 9

# Namespace Documentation

### 9.1 nlohmann Namespace Reference

### 9.2 std Namespace Reference

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- `experimental`
- `regex_constants`
- `rel_ops`
- `this_thread`

#### Data Structures

- class `add_const`
- class `add_cv`
- class `add_lvalue_reference`
- class `add_pointer`
- class `add_rvalue_reference`
- class `add_volatile`
- class `adopt_lock_t`
- class `aligned_storage`
- class `aligned_union`
- class `alignment_of`
- class `allocator`
- class `allocator_arg_t`
- class `allocator_traits`
- class `array`
- class `atomic`
- class `atomic_flag`
- class `auto_ptr`
- class `back_insert_iterator`
- class `bad_alloc`
- class `bad_array_length`
- class `bad_array_new_length`

- class **bad\_cast**
- class **bad\_exception**
- class **bad\_function\_call**
- class **bad\_optional\_access**
- class **bad\_typeid**
- class **bad\_weak\_ptr**
- class **basic\_filebuf**
- class **basic\_fstream**
- class **basic\_ifstream**
- class **basic\_ios**
- class **basic\_iostream**
- class **basic\_istream**
- class **basic\_istreamstream**
- class **basic\_ofstream**
- class **basic\_ostream**
- class **basic\_ostreamstream**
- class **basic\_regex**
- class **basic\_streambuf**
- class **basic\_string**
- class **basic\_stringbuf**
- class **basic\_stringstream**
- class **bernoulli\_distribution**
- class **bidirectional\_iterator\_tag**
- class **binary\_function**
- class **binary\_negate**
- class **binomial\_distribution**
- class **bit\_and**
- class **bit\_not**
- class **bit\_or**
- class **bitset**
- class **cauchy\_distribution**
- class **centi**
- class **cerr**
- class **char\_traits**
- class **chi\_squared\_distribution**
- class **cin**
- class **clock\_t**
- class **clog**
- class **cmatch**
- class **codecvt**
- class **codecvt\_base**
- class **codecvt\_byname**
- class **codecvt\_utf16**
- class **codecvt\_utf8**
- class **codecvt\_utf8\_utf16**
- class **collate**
- class **collate\_byname**
- class **common\_type**
- class **complex**
- class **condition\_variable**
- class **condition\_variable\_any**
- class **conditional**
- class **cout**
- class **cregex\_iterator**
- class **cregex\_token\_iterator**



- class **csub\_match**
- class **ctype**
- class **ctype\_base**
- class **ctype\_byname**
- class **deca**
- class **decay**
- class **deci**
- class **default\_delete**
- class **default\_random\_engine**
- class **defer\_lock\_t**
- class **deque**
- class **discard\_block\_engine**
- class **discrete\_distribution**
- class **divides**
- class **domain\_error**
- class **dynarray**
- class **enable\_if**
- class **enable\_shared\_from\_this**
- class **equal\_to**
- class **errc**
- class **error\_category**
- class **error\_code**
- class **error\_condition**
- class **exa**
- class **exception**
- class **exception\_ptr**
- class **exponential\_distribution**
- class **extent**
- class **extreme\_value\_distribution**
- class **false\_type**
- class **femto**
- class **FILE**
- class **filebuf**
- class **fisher\_f\_distribution**
- class **forward\_iterator\_tag**
- class **forward\_list**
- class **fpos**
- class **fpos\_t**
- class **front\_insert\_iterator**
- class **fstream**
- class **function**
- class **future**
- class **future\_error**
- class **gamma\_distribution**
- class **geometric\_distribution**
- class **giga**
- class **greater**
- class **greater\_equal**
- class **has\_virtual\_destructor**
- class **hash**
- class **hecto**
- class **ifstream**
- class **independent\_bits\_engine**
- class **initializer\_list**
- class **input\_iterator\_tag**

- class **insert\_iterator**
- class **int16\_t**
- class **int32\_t**
- class **int64\_t**
- class **int8\_t**
- class **int\_fast16\_t**
- class **int\_fast32\_t**
- class **int\_fast64\_t**
- class **int\_fast8\_t**
- class **int\_least16\_t**
- class **int\_least32\_t**
- class **int\_least64\_t**
- class **int\_least8\_t**
- class **integer\_sequence**
- class **integral\_constant**
- class **intmax\_t**
- class **intptr\_t**
- class **invalid\_argument**
- class **ios\_base**
- class **iostream**
- class **is\_abstract**
- class **is\_arithmetic**
- class **is\_array**
- class **is\_assignable**
- class **is\_base\_of**
- class **is\_bind\_expression**
- class **is\_class**
- class **is\_compound**
- class **is\_const**
- class **is\_constructible**
- class **is\_convertible**
- class **is\_copy\_assignable**
- class **is\_copy\_constructible**
- class **is\_default\_constructible**
- class **is\_destructible**
- class **is\_empty**
- class **is\_enum**
- class **is\_error\_code\_enum**
- class **is\_error\_condition\_enum**
- class **is\_floating\_point**
- class **is\_function**
- class **is\_fundamental**
- class **is\_integral**
- class **is\_literal\_type**
- class **is\_lvalue\_reference**
- class **is\_member\_function\_pointer**
- class **is\_member\_object\_pointer**
- class **is\_member\_pointer**
- class **is\_move\_assignable**
- class **is\_move\_constructible**
- class **is\_nothrow\_assignable**
- class **is\_nothrow\_constructible**
- class **is\_nothrow\_copy\_assignable**
- class **is\_nothrow\_copy\_constructible**
- class **is\_nothrow\_default\_constructible**

- class **is\_nothrow\_destructible**
- class **is\_nothrow\_move\_assignable**
- class **is\_nothrow\_move\_constructible**
- class **is\_object**
- class **is\_placeholder**
- class **is\_pod**
- class **is\_pointer**
- class **is\_polymorphic**
- class **is\_reference**
- class **is\_rvalue\_reference**
- class **is\_same**
- class **is\_scalar**
- class **is\_signed**
- class **is\_standard\_layout**
- class **is\_trivial**
- class **is\_trivially\_assignable**
- class **is\_trivially\_constructible**
- class **is\_trivially\_copy\_assignable**
- class **is\_trivially\_copy\_constructible**
- class **is\_trivially\_copyable**
- class **is\_trivially\_default\_constructible**
- class **is\_trivially\_destructible**
- class **is\_trivially\_move\_assignable**
- class **is\_trivially\_move\_constructible**
- class **is\_union**
- class **is\_unsigned**
- class **is\_void**
- class **is\_volatile**
- class **istream**
- class **istream\_iterator**
- class **istreambuf\_iterator**
- class **istreamstringstream**
- class **istrstream**
- class **iterator**
- class **iterator\_traits**
- class **jmp\_buf**
- class **kilo**
- class **knuth\_b**
- class **lconv**
- class **length\_error**
- class **less**
- class **less\_equal**
- class **linear\_congruential\_engine**
- class **list**
- class **locale**
- class **lock\_guard**
- class **logic\_error**
- class **logical\_and**
- class **logical\_not**
- class **logical\_or**
- class **lognormal\_distribution**
- class **make\_signed**
- class **make\_unsigned**
- class **map**
- class **match\_results**

- class **max\_align\_t**
- class **mbstate\_t**
- class **mega**
- class **mersenne\_twister\_engine**
- class **messages**
- class **messages\_base**
- class **messages\_byname**
- class **micro**
- class **milli**
- class **minstd\_rand**
- class **minstd\_rand0**
- class **minus**
- class **modulus**
- class **money\_base**
- class **money\_get**
- class **money\_put**
- class **moneypunct**
- class **moneypunct\_byname**
- class **move\_iterator**
- class **mt19937**
- class **mt19937\_64**
- class **multimap**
- class **multiplies**
- class **multiset**
- class **mutex**
- class **nano**
- class **negate**
- class **negative\_binomial\_distribution**
- class **nested\_exception**
- class **new\_handler**
- class **normal\_distribution**
- class **not\_equal\_to**
- class **nothrow\_t**
- class **nullptr\_t**
- class **num\_get**
- class **num\_put**
- class **numeric\_limits**
- class **numpunct**
- class **numpunct\_byname**
- class **ofstream**
- class **once\_flag**
- class **ostream**
- class **ostream\_iterator**
- class **ostreambuf\_iterator**
- class **ostringstream**
- class **ostrstream**
- class **out\_of\_range**
- class **output\_iterator\_tag**
- class **overflow\_error**
- class **owner\_less**
- class **packaged\_task**
- class **pair**
- class **peta**
- class **pico**
- class **piecewise\_constant\_distribution**

- class **piecewise\_construct\_t**
- class **piecewise\_linear\_distribution**
- class **placeholders**
- class **plus**
- class **pointer\_safety**
- class **pointer\_traits**
- class **poisson\_distribution**
- class **priority\_queue**
- class **promise**
- class **ptrdiff\_t**
- class **queue**
- class **random\_access\_iterator\_tag**
- class **random\_device**
- class **range\_error**
- class **rank**
- class **ranlux24**
- class **ranlux24\_base**
- class **ranlux48**
- class **ranlux48\_base**
- class **ratio**
- class **ratio\_add**
- class **ratio\_divide**
- class **ratio\_equal**
- class **ratio\_greater**
- class **ratio\_greater\_equal**
- class **ratio\_less**
- class **ratio\_less\_equal**
- class **ratio\_multiply**
- class **ratio\_not\_equal**
- class **ratio\_subtract**
- class **raw\_storage\_iterator**
- class **recursive\_mutex**
- class **recursive\_timed\_mutex**
- class **reference\_wrapper**
- class **regex**
- class **regex\_error**
- class **regex\_iterator**
- class **regex\_token\_iterator**
- class **regex\_traits**
- class **remove\_all\_extents**
- class **remove\_const**
- class **remove\_cv**
- class **remove\_extent**
- class **remove\_pointer**
- class **remove\_reference**
- class **remove\_volatile**
- class **result\_of**
- class **reverse\_iterator**
- class **runtime\_error**
- class **scoped\_allocator\_adaptor**
- class **seed\_seq**
- class **set**
- class **shared\_future**
- class **shared\_lock**
- class **shared\_ptr**

- class **shared\_timed\_mutex**
- class **shuffle\_order\_engine**
- class **sig\_atomic\_t**
- class **size\_t**
- class **smatch**
- class **sregex\_iterator**
- class **sregex\_token\_iterator**
- class **ssub\_match**
- class **stack**
- class **streambuf**
- class **streamoff**
- class **streampos**
- class **streamsize**
- class **string**
- class **stringbuf**
- class **stringstream**
- class **strstream**
- class **strstreambuf**
- class **student\_t\_distribution**
- class **sub\_match**
- class **subtract\_with\_carry\_engine**
- class **system\_error**
- class **tera**
- class **terminate\_handler**
- class **thread**
- class **time\_base**
- class **time\_get**
- class **time\_get\_byname**
- class **time\_put**
- class **time\_put\_byname**
- class **time\_t**
- class **timed\_mutex**
- class **tm**
- class **true\_type**
- class **try\_to\_lock\_t**
- class **tuple**
- class **type\_index**
- class **type\_info**
- class **u16streampos**
- class **u16string**
- class **u32streampos**
- class **u32string**
- class **uint16\_t**
- class **uint32\_t**
- class **uint64\_t**
- class **uint8\_t**
- class **uint\_fast16\_t**
- class **uint\_fast32\_t**
- class **uint\_fast64\_t**
- class **uint\_fast8\_t**
- class **uint\_least16\_t**
- class **uint\_least32\_t**
- class **uint\_least64\_t**
- class **uint\_least8\_t**
- class **uintmax\_t**

- class **uintptr\_t**
- class **unary\_function**
- class **unary\_negate**
- class **underflow\_error**
- class **underlying\_type**
- class **unexpected\_handler**
- class **uniform\_int\_distribution**
- class **uniform\_real\_distribution**
- class **unique\_lock**
- class **unique\_ptr**
- class **unordered\_map**
- class **unordered\_multimap**
- class **unordered\_multiset**
- class **unordered\_set**
- class **uses\_allocator**
- class **valarray**
- class **vector**
- class **wbuffer\_convert**
- class **wcerr**
- class **wcin**
- class **wclog**
- class **wcmatch**
- class **wcout**
- class **wcregex\_iterator**
- class **wcregex\_token\_iterator**
- class **wcsub\_match**
- class **weak\_ptr**
- class **weibull\_distribution**
- class **wfilebuf**
- class **wfstream**
- class **wifstream**
- class **wiostream**
- class **wistream**
- class **wistringstream**
- class **wofstream**
- class **wostream**
- class **wostringstream**
- class **wregex**
- class **wsmatch**
- class **wsregex\_iterator**
- class **wsregex\_token\_iterator**
- class **wssub\_match**
- class **wstreambuf**
- class **wstreampos**
- class **wstring**
- class **wstring\_convert**
- class **wstringbuf**
- class **wstringstream**
- class **yocto**
- class **yotta**
- class **zetta**

## Functions

- T **atomic\_fetch\_and\_explicit** (T... args)
- T **atomic\_fetch\_xor\_explicit** (T... args)
- T **set\_unexpected** (T... args)
- T **fputs** (T... args)
- T **modf** (T... args)
- T **not2** (T... args)
- T **strlen** (T... args)
- T **exp2** (T... args)
- T **setiosflags** (T... args)
- T **adjacent\_difference** (T... args)
- T **cos** (T... args)
- T **fwscanf** (T... args)
- T **atomic\_init** (T... args)
- T **forward\_as\_tuple** (T... args)
- T **abort** (T... args)
- T **wcsncmp** (T... args)
- T **set\_intersection** (T... args)
- T **atomic\_signal\_fence** (T... args)
- T **llabs** (T... args)
- T **make\_move\_iterator** (T... args)
- T **scanf** (T... args)
- T **nextafter** (T... args)
- T **stol** (T... args)
- T **strcspn** (T... args)
- T **ungetwc** (T... args)
- T **transform** (T... args)
- T **putc** (T... args)
- T **iswdigit** (T... args)
- T **rint** (T... args)
- T **memset** (T... args)
- T **isgraph** (T... args)
- T **replace\_copy\_if** (T... args)
- T **scalbn** (T... args)
- T **partial\_sort\_copy** (T... args)
- T **make\_exception\_ptr** (T... args)
- T **frexp** (T... args)
- T **isxdigit** (T... args)
- T **atomic\_exchange\_explicit** (T... args)
- T **wprintf** (T... args)
- T **fdim** (T... args)
- T **wctype** (T... args)
- T **mbrtoc32** (T... args)
- T **setw** (T... args)
- T **get\_temporary\_buffer** (T... args)
- T **fmax** (T... args)
- T **atomic\_thread\_fence** (T... args)
- T **atomic\_exchange** (T... args)
- T **fgetwc** (T... args)
- T **swprintf** (T... args)
- T **prev\_permutation** (T... args)
- T **max\_element** (T... args)
- T **set\_symmetric\_difference** (T... args)
- T **wcscpy** (T... args)



- T **const\_pointer\_cast** (T... args)
- T **minmax\_element** (T... args)
- T **wcstok** (T... args)
- T **ref** (T... args)
- T **feupdateenv** (T... args)
- T **endl** (T... args)
- T **end** (T... args)
- T **wmemmove** (T... args)
- T **fmin** (T... args)
- T **uninitialized\_fill\_n** (T... args)
- T **noupper** (T... args)
- T **noshowpos** (T... args)
- T **ctime** (T... args)
- T **wmemset** (T... args)
- T **iswpunct** (T... args)
- T **pop\_heap** (T... args)
- T **sprintf** (T... args)
- T **fixed** (T... args)
- T **make\_shared** (T... args)
- T **make\_heap** (T... args)
- T **fmod** (T... args)
- T **atol** (T... args)
- T **uninitialized\_copy** (T... args)
- T **dynamic\_pointer\_cast** (T... args)
- T **set\_union** (T... args)
- T **hexfloat** (T... args)
- T **vswprintf** (T... args)
- T **asctime** (T... args)
- T **iswspace** (T... args)
- T **nan** (T... args)
- T **sort** (T... args)
- T **quick\_exit** (T... args)
- T **log10** (T... args)
- T **mbstowcs** (T... args)
- T **isspace** (T... args)
- T **strncat** (T... args)
- T **isinf** (T... args)
- T **atof** (T... args)
- T **erf** (T... args)
- T **is\_sorted\_until** (T... args)
- T **cbrt** (T... args)
- T **log1p** (T... args)
- T **return\_temporary\_buffer** (T... args)
- T **mbsrtowcs** (T... args)
- T **feraiseexcept** (T... args)
- T **fseek** (T... args)
- T **atomic\_fetch\_or\_explicit** (T... args)
- T **log** (T... args)
- T **putchar** (T... args)
- T **make\_tuple** (T... args)
- T **expm1** (T... args)
- T **fma** (T... args)
- T **remove\_copy\_if** (T... args)
- T **showpoint** (T... args)
- T **fscanf** (T... args)

- T **stable\_partition** (T... args)
- T **fill\_n** (T... args)
- T **remove\_copy** (T... args)
- T **atomic\_compare\_exchange\_strong\_explicit** (T... args)
- T **wctomb** (T... args)
- T **fgets** (T... args)
- T **remainder** (T... args)
- T **allocate\_shared** (T... args)
- T **unique** (T... args)
- T **includes** (T... args)
- T **iswalnum** (T... args)
- T **exit** (T... args)
- T **put\_time** (T... args)
- T **to\_string** (T... args)
- T **is\_heap\_until** (T... args)
- T **wcstold** (T... args)
- T **stold** (T... args)
- T **ftell** (T... args)
- T **copy\_backward** (T... args)
- T **wcstoll** (T... args)
- T **perror** (T... args)
- T **vwscanf** (T... args)
- T **stable\_sort** (T... args)
- T **generic\_category** (T... args)
- T **abs(int)** (T... args)
- T **fgetws** (T... args)
- T **showpos** (T... args)
- T **exp** (T... args)
- T **fill** (T... args)
- T **isalpha** (T... args)
- T **lgamma** (T... args)
- T **feclearexcept** (T... args)
- T **wcsncpy** (T... args)
- T **undecclare\_reachable** (T... args)
- T **oct** (T... args)
- T **strspn** (T... args)
- T **realloc** (T... args)
- T **copy** (T... args)
- T **binary\_search** (T... args)
- T **system\_category** (T... args)
- T **mbrtowc** (T... args)
- T **strtouf** (T... args)
- T **mem\_fn** (T... args)
- T **distance** (T... args)
- T **lock** (T... args)
- T **strcmp** (T... args)
- T **tmpfile** (T... args)
- T **hypot** (T... args)
- T **getenv** (T... args)
- T **strrchr** (T... args)
- T **count** (T... args)
- T **tan** (T... args)
- T **strftime** (T... args)
- T **stod** (T... args)
- T **towupper** (T... args)

- T **atoll** (T... args)
- T **atomic\_store** (T... args)
- T **stoi** (T... args)
- T **rethrow\_exception** (T... args)
- T **sin** (T... args)
- T **atomic\_fetch\_sub\_explicit** (T... args)
- T **unexpected** (T... args)
- T **mbtowc** (T... args)
- T **get\_time** (T... args)
- T **partition** (T... args)
- T **next** (T... args)
- T **isfinite** (T... args)
- T **boolalpha** (T... args)
- T **fetestexcept** (T... args)
- T **mbrlen** (T... args)
- T **iswgraph** (T... args)
- T **time** (T... args)
- T **atomic\_compare\_exchange\_strong** (T... args)
- T **wcschr** (T... args)
- T **uppercase** (T... args)
- T **lower\_bound** (T... args)
- T **copy\_if** (T... args)
- T **isnan** (T... args)
- T **has\_facet** (T... args)
- T **kill\_dependency** (T... args)
- T **uninitialized\_copy\_n** (T... args)
- T **feholdexcept** (T... args)
- T **div** (T... args)
- T **at\_quick\_exit** (T... args)
- T **wcspbrk** (T... args)
- T **search** (T... args)
- T **find\_first\_of** (T... args)
- T **iota** (T... args)
- T **declare\_reachable** (T... args)
- T **atomic\_compare\_exchange\_weak** (T... args)
- T **strtod** (T... args)
- T **accumulate** (T... args)
- T **wcsrchr** (T... args)
- T **min\_element** (T... args)
- T **clearerr** (T... args)
- T **random\_shuffle** (T... args)
- T **iswalpha** (T... args)
- T **atomic\_fetch\_and** (T... args)
- T **wmemchr** (T... args)
- T **bsearch** (T... args)
- T **ilogb** (T... args)
- T **unique\_copy** (T... args)
- T **\_Exit** (T... args)
- T **move** (T... args)
- T **find\_end** (T... args)
- T **fesetexceptflag** (T... args)
- T **nth\_element** (T... args)
- T **gets** (T... args)
- T **lexicographical\_compare** (T... args)
- T **nearbyint** (T... args)

- T **memcpy** (T... args)
- T **fwrite** (T... args)
- T **unitbuf** (T... args)
- T **iswlower** (T... args)
- T **mblen** (T... args)
- T **swscanf** (T... args)
- T **wcstoimax** (T... args)
- T **fprintf** (T... args)
- T **find\_if** (T... args)
- T **strtoimax** (T... args)
- T **isalnum** (T... args)
- T **atomic\_fetch\_add\_explicit** (T... args)
- T **push\_heap** (T... args)
- T **min** (T... args)
- T **fwprintf** (T... args)
- T **uncaught\_exception** (T... args)
- T **strtoll** (T... args)
- T **throw\_with\_nested** (T... args)
- T **shuffle** (T... args)
- T **isprint** (T... args)
- T **get\_new\_handler** (T... args)
- T **call\_once** (T... args)
- T **trunc** (T... args)
- T **wcscspn** (T... args)
- T **mbrtoc16** (T... args)
- T **lround** (T... args)
- T **pow** (T... args)
- T **tgamma** (T... args)
- T **erfc** (T... args)
- T **llround** (T... args)
- T **abs(float)** (T... args)
- T **asinh** (T... args)
- T **feof** (T... args)
- T **noskipws** (T... args)
- T **find** (T... args)
- T **atoi** (T... args)
- T **not1** (T... args)
- T **vscanf** (T... args)
- T **stof** (T... args)
- T **regex\_search** (T... args)
- T **rotate\_copy** (T... args)
- T **set\_new\_handler** (T... args)
- T **undecclare\_no\_pointers** (T... args)
- T **async** (T... args)
- T **partition\_point** (T... args)
- T **vsscanf** (T... args)
- T **fesetround** (T... args)
- T **atomic\_is\_lock\_free** (T... args)
- T **tanh** (T... args)
- T **ldiv** (T... args)
- T **setbase** (T... args)
- T **remove** (T... args)
- T **strtol** (T... args)
- T **strpbrk** (T... args)
- T **signbit** (T... args)

- T **wcsncat** (T... args)
- T **get\_money** (T... args)
- T **set\_difference** (T... args)
- T **cref** (T... args)
- T **getline** (T... args)
- T **to\_wstring** (T... args)
- T **system** (T... args)
- T **static\_pointer\_cast** (T... args)
- T **wcstoumax** (T... args)
- T **memmove** (T... args)
- T **getwchar** (T... args)
- T **scientific** (T... args)
- T **wcsftime** (T... args)
- T **begin** (T... args)
- T **ceil** (T... args)
- T **sinh** (T... args)
- T **is\_permutation** (T... args)
- T **generate\_n** (T... args)
- T **acosh** (T... args)
- T **advance** (T... args)
- T **flush** (T... args)
- T **atomic\_fetch\_xor** (T... args)
- T **ws** (T... args)
- T **signal** (T... args)
- T **noshowbase** (T... args)
- T **generate** (T... args)
- T **ldexp** (T... args)
- T **vsprintf** (T... args)
- T **remove\_if** (T... args)
- T **stoull** (T... args)
- T **fegetexceptflag** (T... args)
- T **find\_if\_not** (T... args)
- T **merge** (T... args)
- T **free** (T... args)
- T **count\_if** (T... args)
- T **clock** (T... args)
- T **mktime** (T... args)
- T **inserter** (T... args)
- T **puts** (T... args)
- T **asin** (T... args)
- T **isctrl** (T... args)
- T **difftime** (T... args)
- T **terminate** (T... args)
- T **memcmp** (T... args)
- T **uninitialized\_fill** (T... args)
- T **hex** (T... args)
- T **tie** (T... args)
- T **back\_inserter** (T... args)
- T **upper\_bound** (T... args)
- T **adjacent\_find** (T... args)
- T **use\_facet** (T... args)
- T **vfprintf** (T... args)
- T **atomic\_fetch\_add** (T... args)
- T **fsetpos** (T... args)
- T **malloc** (T... args)

- T **localtime** (T... args)
- T **wcscmp** (T... args)
- T **c32rtomb** (T... args)
- T **isupper** (T... args)
- T **wcstod** (T... args)
- T **tolower** (T... args)
- T **sort\_heap** (T... args)
- T **isdigit** (T... args)
- T **wcslen** (T... args)
- T **wmemcmp** (T... args)
- T **move\_if\_noexcept** (T... args)
- T **declval** (T... args)
- T **fpclassify** (T... args)
- T **iswupper** (T... args)
- T **rand** (T... args)
- T **atomic\_compare\_exchange\_weak\_explicit** (T... args)
- T **partial\_sort** (T... args)
- T **llrint** (T... args)
- T **fclose** (T... args)
- T **reverse** (T... args)
- T **partial\_sum** (T... args)
- T **showbase** (T... args)
- T **vswscanf** (T... args)
- T **atan** (T... args)
- T **atanh** (T... args)
- T **iter\_swap** (T... args)
- T **scalbln** (T... args)
- T **reverse\_copy** (T... args)
- T **forward** (T... args)
- T **getc** (T... args)
- T **equal\_range** (T... args)
- T **atomic\_fetch\_sub** (T... args)
- T **is\_partitioned** (T... args)
- T **next\_permutation** (T... args)
- T **isblank** (T... args)
- T **noshowpoint** (T... args)
- T **atan2** (T... args)
- T **nanf** (T... args)
- T **towctrans** (T... args)
- T **right** (T... args)
- T **fputwc** (T... args)
- T **strtoul** (T... args)
- T **is\_heap** (T... args)
- T **fflush** (T... args)
- T **strtoumax** (T... args)
- T **nexttoward** (T... args)
- T **nounitbuf** (T... args)
- T **ispunct** (T... args)
- T **noboolalpha** (T... args)
- T **make\_pair** (T... args)
- T **iswctype** (T... args)
- T **srand** (T... args)
- T **replace\_copy** (T... args)
- T **future\_category** (T... args)
- T **resetiosflags** (T... args)

- T **vprintf** (T... args)
- T **gmtime** (T... args)
- T **align** (T... args)
- T **tuple\_cat** (T... args)
- T **ends** (T... args)
- T **set\_terminate** (T... args)
- T **lrint** (T... args)
- T **none\_of** (T... args)
- T **wscanf** (T... args)
- T **fputc** (T... args)
- T **dec** (T... args)
- T **strcat** (T... args)
- T **raise** (T... args)
- T **wcsspn** (T... args)
- T **fabs** (T... args)
- T **wmemcpy** (T... args)
- T **copy\_n** (T... args)
- T **rethrow\_if\_nested** (T... args)
- T **setlocale** (T... args)
- T **addressof** (T... args)
- T **calloc** (T... args)
- T **strerror** (T... args)
- T **strcpy** (T... args)
- T **wcstoul** (T... args)
- T **c16rtomb** (T... args)
- T **generate\_canonical** (T... args)
- T **vfprintf** (T... args)
- T **notify\_all\_at\_thread\_exit** (T... args)
- T **rotate** (T... args)
- T **current\_exception** (T... args)
- T **strtok** (T... args)
- T **wscat** (T... args)
- T **strncpy** (T... args)
- T **tolower** (T... args)
- T **floor** (T... args)
- T **left** (T... args)
- T **ferror** (T... args)
- T **atomic\_load\_explicit** (T... args)
- T **swap** (T... args)
- T **acos** (T... args)
- T **wscoll** (T... args)
- T **sqrt** (T... args)
- T **mbsinit** (T... args)
- T **qsort** (T... args)
- T **stoll** (T... args)
- T **put\_money** (T... args)
- T **wcstoul** (T... args)
- T **wcstol** (T... args)
- T **atexit** (T... args)
- T **atomic\_fetch\_or** (T... args)
- T **rewind** (T... args)
- T **wcsxfrm** (T... args)
- T **round** (T... args)
- T **vwprintf** (T... args)
- T **all\_of** (T... args)

- T **replace** (T... args)
- T **remquo** (T... args)
- T **setbuf** (T... args)
- T **strncmp** (T... args)
- T **localeconv** (T... args)
- T **wctrans** (T... args)
- T **any\_of** (T... args)
- T **equal** (T... args)
- T **max** (T... args)
- T **strxfrm** (T... args)
- T **iswxdigit** (T... args)
- T **labs** (T... args)
- T **regex\_match** (T... args)
- T **fputws** (T... args)
- T **wcrtomb** (T... args)
- T **setprecision** (T... args)
- T **setvbuf** (T... args)
- T **regex\_replace** (T... args)
- T **freopen** (T... args)
- T **logb** (T... args)
- T **wctob** (T... args)
- T **atomic\_load** (T... args)
- T **search\_n** (T... args)
- T **toupper** (T... args)
- T **move\_backward** (T... args)
- T **is\_sorted** (T... args)
- T **strtoull** (T... args)
- T **iswblank** (T... args)
- T **get\_pointer\_safety** (T... args)
- T **get\_unexpected** (T... args)
- T **sscanf** (T... args)
- T **fesetenv** (T... args)
- T **atomic\_store\_explicit** (T... args)
- T **strtold** (T... args)
- T **fread** (T... args)
- T **memchr** (T... args)
- T **btowc** (T... args)
- T **replace\_if** (T... args)
- T **strcoll** (T... args)
- T **vsprintf** (T... args)
- T **mismatch** (T... args)
- T **getchar** (T... args)
- T **islower** (T... args)
- T **tmpnam** (T... args)
- T **nanl** (T... args)
- T **fopen** (T... args)
- T **for\_each** (T... args)
- T **fegetround** (T... args)
- T **ungetc** (T... args)
- T **internal** (T... args)
- T **vfwscanf** (T... args)
- T **fgetc** (T... args)
- T **wcstof** (T... args)
- T **bind** (T... args)
- T **skipws** (T... args)



- T **iswprint** (T... args)
- T **wcstombs** (T... args)
- T **inplace\_merge** (T... args)
- T **copysign** (T... args)
- T **putwchar** (T... args)
- T **wcsstr** (T... args)
- T **fegetenv** (T... args)
- T **longjmp** (T... args)
- T **iswcntrl** (T... args)
- T **declare\_no\_pointers** (T... args)
- T **isnormal** (T... args)
- T **swap\_ranges** (T... args)
- T **minmax** (T... args)
- T **defaultfloat** (T... args)
- T **rename** (T... args)
- T **snprintf** (T... args)
- T **try\_lock** (T... args)
- T **stoul** (T... args)
- T **fgetpos** (T... args)
- T **partition\_copy** (T... args)
- T **vscanf** (T... args)
- T **front\_inserter** (T... args)
- T **get\_terminate** (T... args)
- T **cosh** (T... args)
- T **prev** (T... args)
- T **strchr** (T... args)
- T **strstr** (T... args)
- T **printf** (T... args)
- T **setfill** (T... args)
- T **inner\_product** (T... args)
- template<typename T , typename... CONSTRUCTOR\_ARGS>  
**std::unique\_ptr**< T > [make\\_unique](#) (CONSTRUCTOR\_ARGS &&... constructor\_args)

## 9.2.1 Function Documentation

### 9.2.1.1 `make_unique()`

```
template<typename T , typename... CONSTRUCTOR_ARGS>
std::unique_ptr<T> std::make_unique (
    CONSTRUCTOR_ARGS &&... constructor_args )
```

Definition at line 203 of file `utils.h`.

## 9.3 vxg Namespace Reference

### Namespaces

- [cloud](#)
- [media](#)

## Data Structures

- class [logger](#)  
*Logger class, current implementation based on spdlog.*

## 9.4 vxg::cloud Namespace Reference

### Namespaces

- [agent](#)  
*VXG Cloud Agent namespace.*
- [sync](#)
- [time\\_spec](#)  
*time point*
- [utils](#)

### Data Structures

- class [cloud\\_storage](#)
- struct [period](#)
- class [stream\\_storage](#)
- class [timed\\_storage](#)
- class [timeline](#)

### Typedefs

- using [time](#) = `std::chrono::time_point< std::chrono::system_clock, time\_spec::precision >`
- using [duration](#) = `time_spec::duration< time\_spec::precision >`
- typedef `std::shared_ptr< timed\_storage >` [timed\\_storage\\_ptr](#)

### Functions

- bool [operator<](#) (const [timed\\_storage::item\\_ptr](#) l, const [timed\\_storage::item\\_ptr](#) r)

#### 9.4.1 Typedef Documentation

##### 9.4.1.1 duration

```
typedef time\_spec::duration< time\_spec::precision > vxg::cloud::duration
```

Definition at line 40 of file config.h.

### 9.4.1.2 time

```
typedef std::chrono::time_point< std::chrono::system_clock, time_spec::precision > vxg::cloud::time
```

Definition at line 39 of file config.h.

### 9.4.1.3 timed\_storage\_ptr

```
typedef std::shared_ptr<timed_storage> vxg::cloud::timed_storage_ptr
```

Definition at line 131 of file timeline.h.

## 9.4.2 Function Documentation

### 9.4.2.1 operator<()

```
bool vxg::cloud::operator< (
    const timed_storage::item_ptr l,
    const timed_storage::item_ptr r ) [inline]
```

Definition at line 127 of file timeline.h.

## 9.5 vxg::cloud::agent Namespace Reference

VXG Cloud Agent namespace.

### Namespaces

- [media](#)
- [proto](#)

## Data Structures

- struct [access\\_token](#)  
*VXG Cloud access token.*
- struct [audio\\_config](#)  
*Audio config.*
- struct [audio\\_detection\\_config](#)  
*5.6 [audio\\_detection\\_config](#) (CM) Current audio detection settings.*
- class [callback](#)  
*VXG Cloud manager common callbacks class.*
- struct [event\\_config](#)  
*Event config.*
- class [event\\_manager](#)
- class [event\\_state](#)
- class [event\\_stream](#)  
*Event stream, abstract class for event generation.*
- struct [events\\_config](#)  
*Events config, list of [event\\_config](#) objects.*
- class [manager](#)  
*VXG Cloud agent manager class.*
- struct [osd\\_config](#)  
*OSD config.*
- struct [ptz\\_command](#)  
*PTZ command.*
- struct [ptz\\_config](#)  
*PTZ config.*
- struct [ptz\\_preset](#)  
*PTZ preset.*
- struct [supported\\_stream\\_config](#)  
*Supported stream config.*
- struct [supported\\_streams\\_config](#)  
*Supported streams config, list of [supported\\_stream\\_config](#).*
- class [synchronizer](#)

## Typedefs

- using [event\\_manager\\_ptr](#) = `std::shared_ptr< event\_manager >`
- using [event\\_state\\_ptr](#) = `std::shared_ptr< event\_state >`
- using [synchronizer\\_ptr](#) = `std::shared_ptr< synchronizer >`

## Functions

- `std::string version ()`  
*VXG Cloud Agent library version.*

### 9.5.1 Detailed Description

VXG Cloud Agent namespace.

## 9.5.2 Typedef Documentation

### 9.5.2.1 event\_manager\_ptr

```
using vxg::cloud::agent::event_manager_ptr = typedef std::shared_ptr<event_manager>
```

Definition at line 210 of file event-manager.h.

### 9.5.2.2 event\_state\_ptr

```
using vxg::cloud::agent::event_state_ptr = typedef std::shared_ptr<event_state>
```

Definition at line 200 of file event-state.h.

### 9.5.2.3 synchronizer\_ptr

```
using vxg::cloud::agent::synchronizer_ptr = typedef std::shared_ptr<synchronizer>
```

Definition at line 803 of file timeline-synchronizer.h.

## 9.5.3 Function Documentation

### 9.5.3.1 version()

```
std::string vxg::cloud::agent::version ( )
```

VXG Cloud Agent library version.

Returns

**std::string** version string

## 9.6 vxg::cloud::agent::media Namespace Reference

### Data Structures

- class [rtsp\\_stream](#)  
*Implementation of the [media::stream](#) with RTSP source and NIY stubs.*
- class [stream](#)  
*Cloud agent media stream abstract class.*

## Typedefs

- using `stream_ptr` = `std::shared_ptr<stream>`

### 9.6.1 Typedef Documentation

#### 9.6.1.1 stream\_ptr

```
using vxg::cloud::agent::media::stream_ptr = typedef std::shared_ptr<stream>
```

Definition at line 146 of file agent/stream.h.

## 9.7 vxg::cloud::agent::proto Namespace Reference

### Data Structures

- struct `audio_caps`  
*Audio capabilities.*
- struct `audio_stream_config`  
*Audio media stream config.*
- struct `event_caps`  
*Events capabilities.*
- struct `motion_detection_caps`  
*Motion detection capabilities camera capabilities that limit possible motion detection configuration.*
- struct `motion_detection_config`  
*Motion detection config.*
- struct `motion_region`  
*Motion detection related structs.*
- struct `osd_caps`  
*OSD capabilities.*
- struct `stream_caps`  
*Media stream capabilities.*
- struct `stream_config`  
*Media stream config.*
- struct `video_caps`  
*Video image capabilities.*
- struct `video_clip_info`  
*Video recoding(mp4 file) clip description,.*
- struct `video_config`  
*Video image config.*
- struct `video_stream_config`  
*Video stream config.*
- struct `wifi_config`  
*WiFi config.*
- struct `wifi_network`  
*WiFi network object.*

## Typedefs

- typedef [wifi\\_config](#) [wifi\\_list](#)  
*wifi\_config*

## Enumerations

- enum [mode](#) { [M\\_OFF](#), [M\\_ON](#), [M\\_AUTO](#), [M\\_INVALID](#) }  
*Mode on/off.*
- enum [video\\_format](#) { [VF\\_H264](#), [VF\\_H265](#), [VF\\_MJPEG](#), [VF\\_INVALID](#) }  
*Video codec format.*
- enum [audio\\_format](#) {  
[AF\\_G711A](#), [AF\\_G711U](#), [AF\\_RAW](#), [AF\\_ADPCM](#),  
[AF\\_MP3](#), [AF\\_NELLY8](#), [AF\\_NELLY16](#), [AF\\_NELLY](#),  
[AF\\_OPUS](#), [AF\\_AAC](#), [AF\\_SPEEX](#), [AF\\_INVALID](#) }  
*Audio codec format.*
- enum [audio\\_file\\_format](#) { [AFF\\_AU\\_G711U](#), [AFF\\_MP3](#), [AFF\\_WAV\\_PCM](#), [AFF\\_INVALID](#) }  
*Audio file format.*
- enum [motion\\_sensitivity](#) { [MS\\_REGION](#), [MS\\_FRAME](#), [MS\\_INVALID](#) }  
*Motion sensitivity.*
- enum [motion\\_region\\_shape](#) { [MR\\_RECTANGLE](#), [MR\\_ANY](#), [MR\\_INVALID](#) }  
*Motion region shape.*
- enum [ptz\\_action](#) {  
[A\\_LEFT](#), [A\\_RIGHT](#), [A\\_TOP](#), [A\\_BOTTOM](#),  
[A\\_ZOOM\\_IN](#), [A\\_ZOOM\\_OUT](#), [A\\_STOP](#), [A\\_INVALID](#) }  
*PTZ actions.*
- enum [ptz\\_preset\\_action](#) {  
[PA\\_CREATE](#), [PA\\_DELETE](#), [PA\\_GOTO](#), [PA\\_UPDATE](#),  
[PA\\_INVALID](#) }  
*PTZ preset action.*
- enum [time\\_format\\_n](#) { [TF\\_12H](#), [TF\\_24H](#), [TF\\_INVALID](#) }  
*3.34 get\_osd\_conf (SRV) 3.35 osd\_conf (CM) 3.36 set\_osd\_conf (SRV)*
- enum [event\\_status](#) { [ES\\_OK](#), [ES\\_ERROR](#), [ES\\_INVALID](#) }  
*Event status.*
- enum [event\\_type](#) {  
[ET\\_MOTION](#), [ET\\_SOUND](#), [ET\\_NET](#), [ET\\_RECORD](#),  
[ET\\_MEMORYCARD](#), [ET\\_WIFI](#), [ET\\_CUSTOM](#), [ET\\_INVALID](#) }  
*Types of events.*
- enum [memorycard\\_status](#) {  
[MCS\\_NONE](#), [MCS\\_NORMAL](#), [MCS\\_NEED\\_FORMAT](#), [MCS\\_FORMATTING](#),  
[MCS\\_INITIALIZATION](#), [MCS\\_INVALID](#) }  
*Memory card status.*
- enum [wifi\\_encryption](#) {  
[WFE\\_OPEN](#), [WFE\\_WEP](#), [WFE\\_WPA](#), [WFE\\_WPA2](#),  
[WFE\\_WPA\\_ENTERPRISE](#), [WFE\\_WPA2\\_ENTERPRISE](#), [WFE\\_INVALID](#) }  
*WiFi encryption type.*
- enum [wifi\\_network\\_state](#) {  
[WNS\\_UNKNOWN](#), [WNS\\_INITIALIZE\\_0](#), [WNS\\_INITIALIZE\\_1](#), [WNS\\_TRY\\_CONNECT](#),  
[WNS\\_RECEIVING\\_IP](#), [WNS\\_CONNECTED](#), [WNS\\_INVALID](#) }  
*WiFi connection state.*

## Functions

- `std::string name () const`

## 9.7.1 Typedef Documentation

### 9.7.1.1 wifi\_list

```
typedef wifi_config vxg::cloud::agent::proto::wifi_list
```

wifi\_config

Definition at line 594 of file config.h.

## 9.7.2 Enumeration Type Documentation

### 9.7.2.1 audio\_file\_format

```
enum vxg::cloud::agent::proto::audio_file_format
```

Audio file format.

Enumerator

AFF_AU_G711U	AU file format, encoded in mu-law and sampled with 8 or 16 kHz;.
AFF_MP3	MP3 file format, in mono or stereo with bitrate of 64 kbps to 320 kbps and sample rate of 8 to 48 kHz.
AFF_WAV_PCM	WAV file format, encoded in PCM audio that depends on what the product supports. It may support encoded as 8 or 16-bit mono or stereo and sample rate of 8 to 48 kHz;
AFF_INVALID	Invalid value.

Definition at line 147 of file caps.h.

### 9.7.2.2 audio\_format

```
enum vxg::cloud::agent::proto::audio_format
```

Audio codec format.



## Enumerator

AF_G711A	G711A - PCMA, A-Law.
AF_G711U	G711U - PCMU, U-Law.
AF_RAW	PCM.
AF_ADPCM	G726LE.
AF_MP3	
AF_NELLY8	
AF_NELLY16	
AF_NELLY	
AF_OPUS	
AF_AAC	AAC.
AF_SPEEX	
AF_INVALID	Invalid value.

Definition at line 106 of file caps.h.

### 9.7.2.3 event\_status

```
enum vxg::cloud::agent::proto::event_status
```

Event status.

## Enumerator

ES_OK	Ok.
ES_ERROR	Error.
ES_INVALID	Default status, invalid.

Definition at line 378 of file config.h.

### 9.7.2.4 event\_type

```
enum vxg::cloud::agent::proto::event_type
```

Types of events.

## Enumerator

ET_MOTION	"motion" for motion detection events
ET_SOUND	"sound" for audio detection
ET_NET	"net" for the camera network status change
ET_RECORD	"record" CM informs server about necessity of changing of recording state
ET_MEMORYCARD	"memorycard" camera's memory-card status change
ET_WIFI	"wifi" status of camera's currently used Wi-Fi
ET_CUSTOM	Custom event.
ET_INVALID	Invalid event type.

Definition at line 401 of file config.h.

### 9.7.2.5 memorycard\_status

```
enum vxg::cloud::agent::proto::memorycard_status
```

Memory card status.

#### Enumerator

MCS_NONE	No memorycard.
MCS_NORMAL	Memorycard is OK.
MCS_NEED_FORMAT	Need formatting.
MCS_FORMATTING	Formatting ongoing.
MCS_INITIALIZATION	Initialization, not mounted yet for example.
MCS_INVALID	Invalid value.

Definition at line 481 of file config.h.

### 9.7.2.6 mode

```
enum vxg::cloud::agent::proto::mode
```

Mode on/off.

#### Enumerator

M_OFF	
M_ON	
M_AUTO	
M_INVALID	

Definition at line 30 of file caps.h.

### 9.7.2.7 motion\_region\_shape

```
enum vxg::cloud::agent::proto::motion_region_shape
```

Motion region shape.

#### Enumerator

MR_RECTANGLE	Rectangle.
MR_ANY	Any shape.
MR_INVALID	Invalid.

Definition at line 313 of file caps.h.

### 9.7.2.8 motion\_sensitivity

```
enum vxg::cloud::agent::proto::motion_sensitivity
```

Motion sensitivity.

#### Enumerator

MS_REGION	Indicates if sensitivity can be set for region.
MS_FRAME	Indicates if sensitivity can be only for the full frame.
MS_INVALID	Invalid value.

Definition at line 291 of file caps.h.

### 9.7.2.9 ptz\_action

```
enum vxg::cloud::agent::proto::ptz_action
```

PTZ actions.

#### Enumerator

A_LEFT	Go left.
A_RIGHT	Go right.
A_TOP	Go tip.
A_BOTTOM	Go bottom.
A_ZOOM_IN	Zoom in.
A_ZOOM_OUT	Zoom out.
A_STOP	Stop current action.
A_INVALID	Invalid value.

Definition at line 533 of file caps.h.

### 9.7.2.10 ptz\_preset\_action

```
enum vxg::cloud::agent::proto::ptz_preset_action
```

PTZ preset action.

**Enumerator**

PA_CREATE	
PA_DELETE	
PA_GOTO	
PA_UPDATE	
PA_INVALID	

Definition at line 569 of file caps.h.

**9.7.2.11 time\_format\_n**

```
enum vxg::cloud::agent::proto::time_format_n
```

3.34 get\_osd\_conf (SRV) 3.35 osd\_conf (CM) 3.36 set\_osd\_conf (SRV)

Time format

**Enumerator**

TF_12H	12 hours
TF_24H	24 hours
TF_INVALID	Invalid value.

Definition at line 598 of file caps.h.

**9.7.2.12 video\_format**

```
enum vxg::cloud::agent::proto::video_format
```

Video codec format.

**Enumerator**

VF_H264	H264 (AVC)
VF_H265	H265 (HEVC)
VF_MJPEG	Motion JPEG.
VF_INVALID	Invalid value.

Definition at line 81 of file caps.h.

**9.7.2.13 wifi\_encryption**

```
enum vxg::cloud::agent::proto::wifi_encryption
```

WiFi encryption type.

#### Enumerator

WFE_OPEN	No encryption.
WFE_WEP	WEP.
WFE_WPA	WPA-PSK.
WFE_WPA2	WPA2-PSK.
WFE_WPA_ENTERPRISE	WPA-Enterprise.
WFE_WPA2_ENTERPRISE	WPA2-Enterprise.
WFE_INVALID	Default, invalid value.

Definition at line 517 of file config.h.

#### 9.7.2.14 wifi\_network\_state

```
enum vxg::cloud::agent::proto::wifi_network_state
```

WiFi connection state.

#### Enumerator

WNS_UNKNOWN	
WNS_INITIALIZE_0	
WNS_INITIALIZE_1	
WNS_TRY_CONNECT	
WNS_RECEIVING_IP	
WNS_CONNECTED	
WNS_INVALID	Invalid value.

Definition at line 597 of file config.h.

### 9.7.3 Function Documentation

#### 9.7.3.1 name()

```
std::string vxg::cloud::agent::proto::name ( ) const
```

Definition at line 884 of file config.h.

## 9.8 vxg::cloud::sync Namespace Reference

### Data Structures

- class [timeline](#)

## Typedefs

- using `timeline_ptr` = `std::shared_ptr< timeline >`

### 9.8.1 Typedef Documentation

#### 9.8.1.1 timeline\_ptr

```
using vxg::cloud::sync::timeline_ptr = typedef std::shared_ptr<timeline>
```

Definition at line 591 of file timeline.h.

## 9.9 vxg::cloud::time\_spec Namespace Reference

time point

## Typedefs

- using `precision` = `std::chrono::microseconds`
- template<typename T >  
using `duration` = typename `std::conditional< std::is_same< T, precision >::value, precision, std::chrono::duration< T > >::type`
- using `precision_ratio` = `std::micro`

### 9.9.1 Detailed Description

time point

### 9.9.2 Typedef Documentation

#### 9.9.2.1 duration

```
template<typename T >  
using vxg::cloud::time_spec::duration = typedef typename std::conditional< std::is_same<T,  
precision>::value, precision, std::chrono::duration<T> >::type
```

Definition at line 36 of file config.h.

### 9.9.2.2 precision

```
typedef std::chrono::microseconds vxg::cloud::time_spec::precision
```

Definition at line 32 of file config.h.

### 9.9.2.3 precision\_ratio

```
using vxg::cloud::time_spec::precision_ratio = typedef std::micro
```

Definition at line 16 of file utils.h.

## 9.10 vxg::cloud::utils Namespace Reference

### Namespaces

- [gcc\\_abi](#)
- [motion](#)
- [time](#)

### Data Structures

- class [queued\\_async\\_handler](#)
- struct [uri](#)

### Typedefs

- `template<class T >`  
using [queued\\_async\\_handler\\_ptr](#) = `std::shared_ptr< queued\_async\_handler< T > >`

### Functions

- void [set\\_thread\\_name](#) ( `std::string name` )
- `template<typename... Args>`  
`std::string string\_format (const std::string &format, Args... args)`
- `std::string string\_trim (const std::string &name, std::regex regx)`
- `std::string string\_trim (const std::string &name)`
- `std::vector< std::string > string\_split (const std::string &s, char delimiter)`
- `bool string\_startswith ( std::string const &fullString, std::string const &start)`
- `bool string\_endswith ( std::string const &fullString, std::string const &ending)`
- `bool string\_replace ( std::string &str, const std::string &from, const std::string &to)`
- `std::string string\_urlencode (const std::string &value)`
- `std::string string\_urldecode (const std::string &text)`
- `std::string string\_tolower (const std::string &s)`
- `std::string string\_toupper (const std::string &s)`
- `bool string\_contains ( std::string s, char c)`
- `bool string\_contains ( std::string s, std::string substring)`
- `std::string dirname (const std::string &filepath)`
- `std::string random\_string (size_t length=32)`

## 9.10.1 Typedef Documentation

### 9.10.1.1 `queued_async_handler_ptr`

```
template<class T >
using vxg::cloud::utils::queued_async_handler_ptr = typedef std::shared_ptr<queued_async_handler<T>
>
```

Definition at line 61 of file `queued-handler.h`.

## 9.10.2 Function Documentation

### 9.10.2.1 `dirname()`

```
std::string vxg::cloud::utils::dirname (
    const std::string & filepath )
```

### 9.10.2.2 `random_string()`

```
std::string vxg::cloud::utils::random_string (
    size_t length = 32 ) [inline]
```

Definition at line 182 of file `utils.h`.

### 9.10.2.3 `set_thread_name()`

```
void vxg::cloud::utils::set_thread_name (
    std::string name )
```

### 9.10.2.4 `string_contains()` [1/2]

```
bool vxg::cloud::utils::string_contains (
    std::string s,
    char c ) [inline]
```

Definition at line 170 of file `utils.h`.



### 9.10.2.5 string\_contains() [2/2]

```
bool vxg::cloud::utils::string_contains (
    std::string s,
    std::string substring ) [inline]
```

Definition at line 173 of file utils.h.

### 9.10.2.6 string\_endswith()

```
bool vxg::cloud::utils::string_endswith (
    std::string const & fullString,
    std::string const & ending )
```

### 9.10.2.7 string\_format()

```
template<typename... Args>
std::string vxg::cloud::utils::string_format (
    const std::string & format,
    Args... args )
```

Definition at line 147 of file utils.h.

### 9.10.2.8 string\_replace()

```
bool vxg::cloud::utils::string_replace (
    std::string & str,
    const std::string & from,
    const std::string & to )
```

### 9.10.2.9 string\_split()

```
std::vector< std::string> vxg::cloud::utils::string_split (
    const std::string & s,
    char delimiter )
```

#### 9.10.2.10 string\_startswith()

```
bool vxg::cloud::utils::string_startswith (
    std::string const & fullString,
    std::string const & start )
```

#### 9.10.2.11 string\_tolower()

```
std::string vxg::cloud::utils::string_tolower (
    const std::string & s )
```

#### 9.10.2.12 string\_toupper()

```
std::string vxg::cloud::utils::string_toupper (
    const std::string & s )
```

#### 9.10.2.13 string\_trim() [1/2]

```
std::string vxg::cloud::utils::string_trim (
    const std::string & name )
```

#### 9.10.2.14 string\_trim() [2/2]

```
std::string vxg::cloud::utils::string_trim (
    const std::string & name,
    std::regex regex )
```

#### 9.10.2.15 string\_urldecode()

```
std::string vxg::cloud::utils::string_urldecode (
    const std::string & text )
```

#### 9.10.2.16 string\_urlencode()

```
std::string vxg::cloud::utils::string_urlencode (
    const std::string & value )
```

## 9.11 vxg::cloud::utils::gcc\_abi Namespace Reference

### Functions

- `std::string demangle ( std::string name)`

#### 9.11.1 Function Documentation

##### 9.11.1.1 demangle()

```
std::string vxg::cloud::utils::gcc_abi::demangle (
    std::string name )
```

## 9.12 vxg::cloud::utils::motion Namespace Reference

### Data Structures

- struct `map`

## 9.13 vxg::cloud::utils::time Namespace Reference

### Functions

- `cloud::time now ()`
- `std::string now_ISO8601.UTC ()`
- `std::string now_ISO8601.UTC_packed ()`
- `std::string to_iso_8601 (cloud::time t)`
- `std::string to_iso (cloud::time t)`
- `std::string to_iso2 (cloud::time t)`
- `std::string to_iso_packed (cloud::time t)`
- `std::string to_iso_local (cloud::time t)`
- `cloud::time from_double (double t)`
- `double to_double (cloud::time t)`
- `cloud::time from_iso ( std::string st)`
- `cloud::time from_iso2 ( std::string st)`
- `cloud::time from_iso_packed ( std::string st)`
- `bool iso_time_valid (const std::string &s)`
- `cloud::time null ()`
- `cloud::time epoch ()`
- `cloud::time max ()`
- `bool is_iso_packed (const std::string &s)`
- `bool is_iso (const std::string &s)`

### 9.13.1 Function Documentation

#### 9.13.1.1 epoch()

```
cloud::time vxg::cloud::utils::time::epoch ( ) [inline]
```

Definition at line 54 of file utils.h.

#### 9.13.1.2 from\_double()

```
cloud::time vxg::cloud::utils::time::from_double (
    double t )
```

#### 9.13.1.3 from\_iso()

```
cloud::time vxg::cloud::utils::time::from_iso (
    std::string st )
```

#### 9.13.1.4 from\_iso2()

```
cloud::time vxg::cloud::utils::time::from_iso2 (
    std::string st )
```

#### 9.13.1.5 from\_iso\_packed()

```
cloud::time vxg::cloud::utils::time::from_iso_packed (
    std::string st )
```

#### 9.13.1.6 is\_iso()

```
bool vxg::cloud::utils::time::is_iso (
    const std::string & s )
```

#### 9.13.1.7 is\_iso\_packed()

```
bool vxg::cloud::utils::time::is_iso_packed (
    const std::string & s )
```

#### 9.13.1.8 iso\_time\_valid()

```
bool vxg::cloud::utils::time::iso_time_valid (
    const std::string & s )
```

#### 9.13.1.9 max()

```
cloud::time vxg::cloud::utils::time::max ( ) [inline]
```

Definition at line 58 of file utils.h.

#### 9.13.1.10 now()

```
cloud::time vxg::cloud::utils::time::now ( ) [inline]
```

Definition at line 32 of file utils.h.

#### 9.13.1.11 now\_ISO8601.UTC()

```
std::string vxg::cloud::utils::time::now_ISO8601.UTC ( )
```

#### 9.13.1.12 now\_ISO8601.UTC\_packed()

```
std::string vxg::cloud::utils::time::now_ISO8601.UTC_packed ( )
```

#### 9.13.1.13 null()

```
cloud::time vxg::cloud::utils::time::null ( ) [inline]
```

Definition at line 51 of file utils.h.

#### 9.13.1.14 to\_double()

```
double vxg::cloud::utils::time::to_double (
    cloud::time t )
```

#### 9.13.1.15 to\_iso()

```
std::string vxg::cloud::utils::time::to_iso (
    cloud::time t )
```

#### 9.13.1.16 to\_iso2()

```
std::string vxg::cloud::utils::time::to_iso2 (
    cloud::time t )
```

#### 9.13.1.17 to\_iso\_8601()

```
std::string vxg::cloud::utils::time::to_iso_8601 (
    cloud::time t )
```

#### 9.13.1.18 to\_iso\_local()

```
std::string vxg::cloud::utils::time::to_iso_local (
    cloud::time t )
```

#### 9.13.1.19 to\_iso\_packed()

```
std::string vxg::cloud::utils::time::to_iso_packed (
    cloud::time t )
```

## 9.14 vxg::media Namespace Reference

### Namespaces

- [ffmpeg](#)
- [Streamer](#)

## Data Structures

- class [rtmp\\_sink](#)  
*RTMP sink class.*
- class [rtmp\\_source](#)  
*RTMP source class.*
- class [rtsp\\_source](#)  
*RTSP source class.*
- class [stream](#)  
*base media stream abstract class*

## 9.15 vxg::media::ffmpeg Namespace Reference

### Data Structures

- class [Sink](#)  
*Base ffmpeg sink class.*
- class [Source](#)  
*Base ffmpeg source class.*

## 9.16 vxg::media::Streamer Namespace Reference

### Data Structures

- class [ISink](#)
- class [ISource](#)  
*ISource interface class.*
- struct [MediaFrame](#)  
*Media frame container.*
- struct [StreamInfo](#)  
*Stream info description.*

### Typedefs

- using [on\\_error\\_cb](#) = **std::function**< void([Streamer::StreamError](#) e)>  
*On error callback, used for both [ISink](#) and [ISource](#) if was provided by user.*

### Enumerations

- enum [DropDirection](#) { [DROP\\_FRONT](#), [DROP\\_BACK](#) }
- enum [StreamError](#) { [E\\_NONE](#), [E\\_FATAL](#), [E\\_EOS](#) }  
*Stream error.*
- enum [MediaType](#) {  
[UNKNOWN](#), [VIDEO](#), [VIDEO\\_AVC\\_SPS](#), [VIDEO\\_AVC\\_PPS](#),  
[VIDEO\\_SEQ\\_HDR](#), [AUDIO](#), [AUDIO\\_SEQ\\_HDR](#), [FLV](#),  
[DATA](#), [MAX](#) }  
*Media frame type.*

## Variables

- constexpr int [SINK\\_THREAD\\_PRIO](#)
- constexpr int [SRC\\_THREAD\\_PRIO](#)

## 9.16.1 Typedef Documentation

### 9.16.1.1 on\_error\_cb

```
using vxg::media::Streamer::on_error_cb = typedef std::function<void(Streamer::StreamError
e)>
```

On error callback, used for both [ISink](#) and [ISource](#) if was provided by user.

Definition at line 53 of file base\_streamer.h.

## 9.16.2 Enumeration Type Documentation

### 9.16.2.1 DropDirection

```
enum vxg::media::Streamer::DropDirection
```

Enumerator

DROP_FRONT	
DROP_BACK	

Definition at line 38 of file base\_streamer.h.

### 9.16.2.2 MediaType

```
enum vxg::media::Streamer::MediaType
```

Media frame type.

Used to indicate when type of frame was passed from source to sink.

Enumerator

UNKNOWN	
VIDEO	



## Enumerator

VIDEO_AVC_SPS	
VIDEO_AVC_PPS	
VIDEO_SEQ_HDR	
AUDIO	
AUDIO_SEQ_HDR	
FLV	
DATA	
MAX	

Definition at line 404 of file base\_streamer.h.

### 9.16.2.3 StreamError

```
enum vxg::media::Streamer::StreamError
```

Stream error.

## Enumerator

E_NONE	
E_FATAL	
E_EOS	

Definition at line 44 of file base\_streamer.h.

## 9.16.3 Variable Documentation

### 9.16.3.1 SINK\_THREAD\_PRIO

```
constexpr int vxg::media::Streamer::SINK_THREAD_PRIO [constexpr]
```

Definition at line 36 of file base\_streamer.h.

### 9.16.3.2 SRC\_THREAD\_PRIO

```
constexpr int vxg::media::Streamer::SRC_THREAD_PRIO [constexpr]
```

Definition at line 37 of file base\_streamer.h.



## Chapter 10

# Data Structure Documentation

### 10.1 vxg::cloud::agent::access\_token Struct Reference

VXG Cloud access token.

```
#include <agent-proto/objects/config.h>
```

#### Data Structures

- struct [proxy\\_config](#)  
*Socks proxy settings.*

#### Public Types

- typedef **std::shared\_ptr**< [access\\_token](#) > ptr

#### Public Member Functions

- **std::string** [api\\_uri](#) (bool secure=true)
- **std::string** [cam\\_base\\_uri](#) (bool secure=true, const **std::string** &input\_host="")
- **std::string** [pack](#) ()

#### Static Public Member Functions

- static [access\\_token](#) [parse](#) ( **std::string** packed\_token)

#### 10.1.1 Detailed Description

VXG Cloud access token.

Definition at line 1189 of file config.h.

## 10.1.2 Member Typedef Documentation

### 10.1.2.1 ptr

```
typedef std::shared_ptr<access_token> vxg::cloud::agent::access_token::ptr
```

Definition at line 1190 of file config.h.

## 10.1.3 Member Function Documentation

### 10.1.3.1 api\_uri()

```
std::string vxg::cloud::agent::access_token::api_uri (
    bool secure = true ) [inline]
```

Definition at line 1258 of file config.h.

### 10.1.3.2 cam\_base\_uri()

```
std::string vxg::cloud::agent::access_token::cam_base_uri (
    bool secure = true,
    const std::string & input_host = "" ) [inline]
```

Definition at line 1266 of file config.h.

### 10.1.3.3 pack()

```
std::string vxg::cloud::agent::access_token::pack ( ) [inline]
```

Definition at line 1276 of file config.h.

### 10.1.3.4 parse()

```
static access_token vxg::cloud::agent::access_token::parse (
    std::string packed_token ) [inline], [static]
```

Definition at line 1278 of file config.h.

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

- [config.h](#)

## 10.2 alter\_bool Struct Reference

alternative bool class Standard bool type has two states, this class adds 3rd state - undefined.

```
#include <agent-proto/command/unset-helper.h>
```

### Public Types

- enum `n_alter_bool` { `B_FALSE`, `B_TRUE`, `B_INVALID` }  
*Internal boolean values.*

### Public Member Functions

- `alter_bool` (const `n_alter_bool` &*v*)
- `alter_bool` (const bool &*v*)
- `alter_bool operator=` (const bool &*b*)
- `operator bool` () const

### Data Fields

- `n_alter_bool` *val*

### Friends

- void `from_json` (const `nlohmann::json` &*j*, `alter_bool` &*c*)
- void `to_json` (`nlohmann::json` &*j*, const `alter_bool` &*c*)

### 10.2.1 Detailed Description

alternative bool class Standard bool type has two states, this class adds 3rd state - undefined.

This class used for json boolean => C++ bool type reflection. The `B_INVALID` value of the C++ data indicates that source json has no such field.

Definition at line 168 of file unset-helper.h.

### 10.2.2 Member Enumeration Documentation

#### 10.2.2.1 n\_alter\_bool

```
enum alter_bool::n_alter_bool
```

Internal boolean values.

**Enumerator**

B_FALSE	false
B_TRUE	true
B_INVALID	Undefined, i.e. if the object was constructed from the json object this value means that original json had no such field.

Definition at line 170 of file unset-helper.h.

## 10.2.3 Constructor & Destructor Documentation

### 10.2.3.1 alter\_bool() [1/2]

```
alter_bool::alter_bool (
    const n_alter_bool & v ) [inline]
```

Definition at line 180 of file unset-helper.h.

### 10.2.3.2 alter\_bool() [2/2]

```
alter_bool::alter_bool (
    const bool & v ) [inline]
```

Definition at line 182 of file unset-helper.h.

## 10.2.4 Member Function Documentation

### 10.2.4.1 operator bool()

```
alter_bool::operator bool ( ) const [inline]
```

Definition at line 196 of file unset-helper.h.

### 10.2.4.2 operator=()

```
alter_bool alter_bool::operator= (
    const bool & b ) [inline]
```

Definition at line 189 of file unset-helper.h.

## 10.2.5 Friends And Related Function Documentation

### 10.2.5.1 from\_json

```
void from_json (  
    const nlohmann::json & j,  
    alter_bool & c ) [friend]
```

Definition at line 202 of file unset-helper.h.

### 10.2.5.2 to\_json

```
void to_json (  
    nlohmann::json & j,  
    const alter_bool & c ) [friend]
```

Definition at line 209 of file unset-helper.h.

## 10.2.6 Field Documentation

### 10.2.6.1 val

```
n_alter_bool alter_bool::val
```

Definition at line 216 of file unset-helper.h.

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

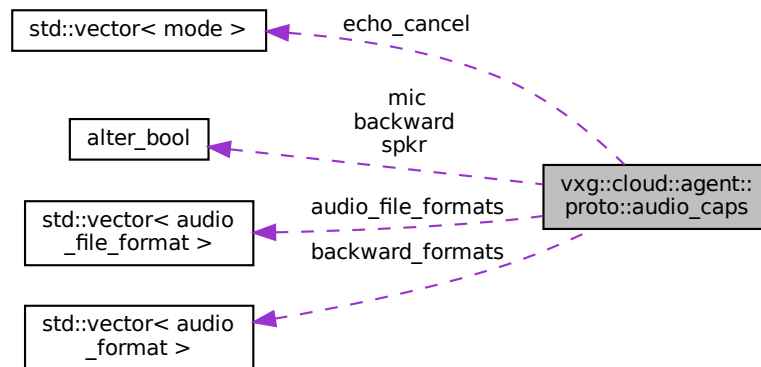
- [unset-helper.h](#)

## 10.3 vxg::cloud::agent::proto::audio\_caps Struct Reference

Audio capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::audio\_caps:



### Data Fields

- [alter\\_bool mic](#)  
*mic: bool, microphone is supported*
- [alter\\_bool spkr](#)  
*spkr: bool, speaker is supported*
- **std::vector**< [mode](#) > [echo\\_cancel](#)  
*echo\_cancel: list of string, echo cancellation modes, empty or absent means not supported*
- [alter\\_bool backward](#)  
*backward: bool, backward audio supported.*
- **std::vector**< [audio\\_format](#) > [backward\\_formats](#)  
*backward\_formats: list of audio\_format, list of supported backward formats.*
- **std::vector**< [audio\\_file\\_format](#) > [audio\\_file\\_formats](#)  
*audio\_file\_formats: list of string, list of supported formats of audio files.*

### 10.3.1 Detailed Description

Audio capabilities.

Definition at line 490 of file caps.h.

### 10.3.2 Field Documentation



### 10.3.2.1 audio\_file\_formats

```
std::vector<audio_file_format> vxg::cloud::agent::proto::audio_caps::audio_file_formats
```

audio\_file\_formats: list of string, list of supported formats of audio files.

Definition at line 513 of file caps.h.

### 10.3.2.2 backward

```
alter_bool vxg::cloud::agent::proto::audio_caps::backward
```

backward: bool, backward audio supported.

Obsolete. Server will ignore it when backward\_formats exists. If true and backward\_formats is missed, server will interpret supported formats list as ["UNKNOWN"]

Definition at line 503 of file caps.h.

### 10.3.2.3 backward\_formats

```
std::vector<audio_format> vxg::cloud::agent::proto::audio_caps::backward_formats
```

backward\_formats: list of audio\_format, list of supported backward formats.

Supported values: ["RAW", "ADPCM", "MP3", "NELLY8", "NELLY16", "NELLY", "G711A", "G711U", "AAC", "SPEEX", "UNKNOWN"]. Empty list or missing parameter – camera doesn't support back audio channel.

Definition at line 509 of file caps.h.

### 10.3.2.4 echo\_cancel

```
std::vector<mode> vxg::cloud::agent::proto::audio_caps::echo_cancel
```

echo\_cancel: list of string, echo cancellation modes, empty or absent means not supported

Definition at line 498 of file caps.h.

### 10.3.2.5 mic

```
alter_bool vxg::cloud::agent::proto::audio_caps::mic
```

mic: bool, microphone is supported

Definition at line 492 of file caps.h.

### 10.3.2.6 spkr

`alter_bool` vxg::cloud::agent::proto::audio\_caps::spkr

spkr: bool, speaker is supported

Definition at line 495 of file caps.h.

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

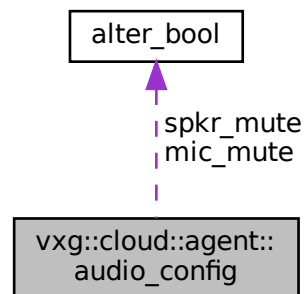
- [caps.h](#)

## 10.4 vxg::cloud::agent::audio\_config Struct Reference

Audio config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::audio\_config:



### Data Fields

- int [mic\\_gain](#)  
*mic\_gain: optional int range 0-100, microphone gain*
- [alter\\_bool](#) [mic\\_mute](#)  
*mic\_mute: optional bool, microphone mute*
- int [spkr\\_vol](#)  
*spkr\_vol: optional int range 0-100, speaker volume*
- [alter\\_bool](#) [spkr\\_mute](#)  
*spkr\_mute: optional bool, speaker mute*
- mode [echo\\_cancel](#)  
*echo\_cancel: optional string, echo cancellation mode, "" means off*
- audio\_caps [caps](#)  
*caps*

### 10.4.1 Detailed Description

Audio config.

Definition at line 1033 of file config.h.

### 10.4.2 Field Documentation

#### 10.4.2.1 caps

```
audio_caps vxg::cloud::agent::audio_config::caps
```

caps

Definition at line 1046 of file config.h.

#### 10.4.2.2 echo\_cancel

```
mode vxg::cloud::agent::audio_config::echo_cancel
```

echo\_cancel: optional string, echo cancellation mode, "" means off

Definition at line 1043 of file config.h.

#### 10.4.2.3 mic\_gain

```
int vxg::cloud::agent::audio_config::mic_gain
```

mic\_gain: optional int range 0-100, microphone gain

Definition at line 1035 of file config.h.

#### 10.4.2.4 mic\_mute

```
alter_bool vxg::cloud::agent::audio_config::mic_mute
```

mic\_mute: optional bool, microphone mute

Definition at line 1037 of file config.h.

#### 10.4.2.5 spkr\_mute

`alter_bool vxg::cloud::agent::audio_config::spkr_mute`

spkr\_mute: optional bool, speaker mute

Definition at line 1041 of file config.h.

#### 10.4.2.6 spkr\_vol

`int vxg::cloud::agent::audio_config::spkr_vol`

spkr\_vol: optional int range 0-100, speaker volume

Definition at line 1039 of file config.h.

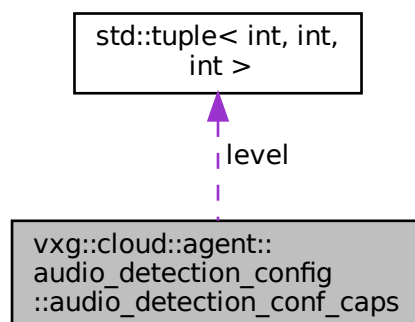
The documentation for this struct was generated from the following file:

- [config.h](#)

### 10.5 vxg::cloud::agent::audio\_detection\_config::audio\_detection\_conf\_caps Struct Reference

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::audio\_detection\_config::audio\_detection\_conf\_caps:



#### Public Member Functions

- [JSON\\_DEFINE\\_TYPE\\_INTRUSIVE](#) (audio\_detection\_conf\_caps, level)

## Data Fields

- **std::tuple**< int, int, int > [level](#)  
*level: (min:int, max:int, step:int), volume range and step in -dB*

### 10.5.1 Detailed Description

Definition at line 1428 of file config.h.

### 10.5.2 Member Function Documentation

#### 10.5.2.1 JSON\_DEFINE\_TYPE\_INTRUSIVE()

```
vxg::cloud::agent::audio_detection_config::audio_detection_conf_caps::JSON_DEFINE_TYPE_INTRUSIVE (
    audio_detection_conf_caps ,
    level )
```

### 10.5.3 Field Documentation

#### 10.5.3.1 level

```
std::tuple<int, int, int> vxg::cloud::agent::audio_detection_config::audio_detection_conf_caps::level
```

level: (min:int, max:int, step:int), volume range and step in -dB

Definition at line 1430 of file config.h.

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

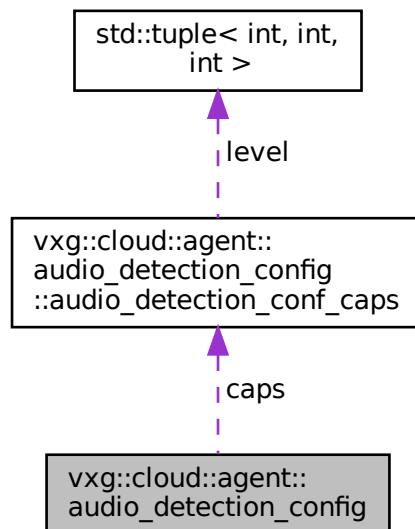
- [config.h](#)

## 10.6 vxg::cloud::agent::audio\_detection\_config Struct Reference

5.6 [audio\\_detection\\_config](#) (CM) Current audio detection settings.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::audio\_detection\_config:



### Data Structures

- struct [audio\\_detection\\_conf\\_caps](#)

### Public Member Functions

- [JSON\\_DEFINE\\_TYPE\\_INTRUSIVE](#) ([audio\\_detection\\_config](#), [level](#), [length](#), [caps](#))

### Data Fields

- int [level](#)  
*level: int, audio volume in -dB*
- int [length](#)  
*length: int, duration before event trigger, msec*
- [audio\\_detection\\_conf\\_caps](#) [caps](#)  
*caps:*

## 10.6.1 Detailed Description

5.6 [audio\\_detection\\_config](#) (CM) Current audio detection settings.

Reply 5.4 [get\\_audio\\_detection](#) (SRV).

Definition at line 1422 of file [config.h](#).

## 10.6.2 Member Function Documentation

### 10.6.2.1 JSON\_DEFINE\_TYPE\_INTRUSIVE()

```
vxg::cloud::agent::audio_detection_config::JSON_DEFINE_TYPE_INTRUSIVE (
    audio\_detection\_config ,
    level ,
    length ,
    caps )
```

## 10.6.3 Field Documentation

### 10.6.3.1 caps

[audio\\_detection\\_conf\\_caps](#) vxg::cloud::agent::audio\_detection\_config::caps

caps:

Definition at line 1435 of file [config.h](#).

### 10.6.3.2 length

```
int vxg::cloud::agent::audio_detection_config::length
```

length: int, duration before event trigger, msec

Definition at line 1426 of file [config.h](#).

### 10.6.3.3 level

```
int vxg::cloud::agent::audio_detection_config::level
```

level: int, audio volume in -dB

Definition at line 1424 of file config.h.

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

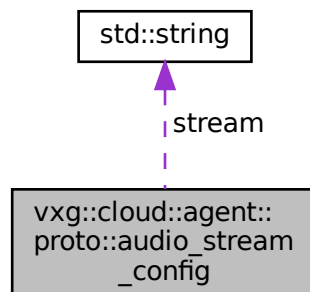
- [config.h](#)

## 10.7 vxg::cloud::agent::proto::audio\_stream\_config Struct Reference

Audio media stream config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::audio\_stream\_config:



### Data Fields

- **std::string** [stream](#)  
*Mandatory: audio ES to use.*
- [audio\\_format](#) **format**  
*Mandatory: audio encoding format.*
- int [brt](#)  
*Mandatory: bitrate, kbps.*
- double [srt](#)  
*Mandatory: samplerate, KHz.*



## 10.7.1 Detailed Description

Audio media stream config.

Definition at line 179 of file config.h.

## 10.7.2 Field Documentation

### 10.7.2.1 brt

```
int vxg::cloud::agent::proto::audio_stream_config::brt
```

Mandatory: bitrate, kbps.

Definition at line 190 of file config.h.

### 10.7.2.2 format

```
audio_format vxg::cloud::agent::proto::audio_stream_config::format
```

Mandatory: audio encoding format.

Definition at line 186 of file config.h.

### 10.7.2.3 srt

```
double vxg::cloud::agent::proto::audio_stream_config::srt
```

Mandatory: samplerate, KHz.

Definition at line 194 of file config.h.

### 10.7.2.4 stream

```
std::string vxg::cloud::agent::proto::audio_stream_config::stream
```

Mandatory: audio ES to use.

Definition at line 182 of file config.h.

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

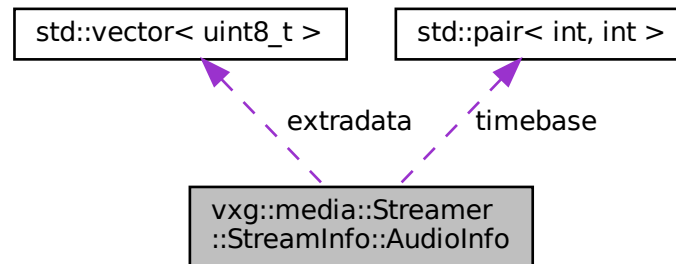
- [config.h](#)

## 10.8 vxg::media::Streamer::StreamInfo::AudioInfo Struct Reference

Audio stream info.

```
#include <streamer/base_streamer.h>
```

Collaboration diagram for vxg::media::Streamer::StreamInfo::AudioInfo:



### Data Fields

- [AudioCodec codec](#)  
*Audio codec.*
- int [channels](#)  
*Audio channels.*
- int [samplerate](#)  
*Audio samplerate.*
- int [bitrate](#)  
*Audio bitrate.*
- **std::pair**< int, int > [timebase](#)  
*Audio timestamps timescale.*
- **std::vector**< uint8\_t > [extradata](#)  
*Audio extradata. AAC requires one.*

### 10.8.1 Detailed Description

Audio stream info.

Definition at line 364 of file base\_streamer.h.

### 10.8.2 Field Documentation

### 10.8.2.1 bitrate

```
int vxg::media::Streamer::StreamInfo::AudioInfo::bitrate
```

Audio bitrate.

Definition at line 372 of file base\_streamer.h.

### 10.8.2.2 channels

```
int vxg::media::Streamer::StreamInfo::AudioInfo::channels
```

Audio channels.

Definition at line 368 of file base\_streamer.h.

### 10.8.2.3 codec

```
AudioCodec vxg::media::Streamer::StreamInfo::AudioInfo::codec
```

Audio codec.

Definition at line 366 of file base\_streamer.h.

### 10.8.2.4 extradata

```
std::vector<uint8_t> vxg::media::Streamer::StreamInfo::AudioInfo::extradata
```

Audio extradata. AAC requires one.

Definition at line 376 of file base\_streamer.h.

### 10.8.2.5 samplerate

```
int vxg::media::Streamer::StreamInfo::AudioInfo::samplerate
```

Audio samplerate.

Definition at line 370 of file base\_streamer.h.

### 10.8.2.6 timebase

```
std::pair<int, int> vxg::media::Streamer::StreamInfo::AudioInfo::timebase
```

Audio timestamps timescale.

Definition at line 374 of file base\_streamer.h.

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

- [base\\_streamer.h](#)

## 10.9 vxg::cloud::agent::callback Class Reference

VXG Cloud manager common callbacks class.

```
#include <agent/callback.h>
```

### Public Types

- typedef **std::unique\_ptr**< [callback](#) > ptr  
*std::unique\_ptr to callback*

### Public Member Functions

- virtual void [on\\_bye](#) (proto::command::bye\_reason reason)=0  
*VXG Cloud Bye command callback.*
- virtual void [on\\_registered](#) (const **std::string** &sid)  
*Registration on the Cloud has passed callback.*
- virtual bool [on\\_raw\\_msg](#) ( **std::string** client\_id, **std::string** &data)  
*raw message callback*
- virtual bool [on\\_get\\_log](#) ( **std::string** &log\_data)  
*Get logging data callback.*
- virtual bool [on\\_start\\_backward\\_audio](#) ( **std::string** url)  
*Start backward audio stream.*
- virtual bool [on\\_stop\\_backward\\_audio](#) ( **std::string** url)  
*Stop backward audio.*
- virtual bool [on\\_get\\_cam\\_video\\_config](#) (proto::video\_config &config)  
*Get video image config.*
- virtual bool [on\\_set\\_cam\\_video\\_config](#) (const proto::video\_config &config)  
*Set video input config.*
- virtual bool [on\\_get\\_cam\\_audio\\_config](#) (proto::audio\_config &config)  
*Get audio input configuration.*
- virtual bool [on\\_set\\_cam\\_audio\\_config](#) (const proto::audio\_config &config)  
*Set audio input/output config.*
- virtual bool [on\\_get\\_ptz\\_config](#) (proto::ptz\_config &config)  
*Get PTZ config.*
- virtual bool [on\\_cam\\_ptz](#) (proto::ptz\_command &command)

- PTZ command.*
- virtual bool [on\\_cam\\_ptz\\_preset](#) (proto::ptz\_preset &preset\_op)
- PTZ preset command.*
- virtual bool [on\\_get\\_osd\\_config](#) (proto::osd\_config &config)
- Get OSD config.*
- virtual bool [on\\_set\\_osd\\_config](#) (const proto::osd\_config &config)
- Set OSD config.*
- virtual bool [on\\_get\\_wifi\\_config](#) (proto::wifi\_config &config)
- Get WiFi config.*
- virtual bool [on\\_set\\_wifi\\_config](#) (const proto::wifi\_network &config)
- Set WiFi config.*
- virtual bool [on\\_get\\_motion\\_detection\\_config](#) (proto::motion\_detection\_config &config)
- Get motion detection configuration.*
- virtual bool [on\\_set\\_motion\\_detection\\_config](#) (const proto::motion\_detection\_config &config)
- Set motion detection config.*
- virtual bool [on\\_get\\_timezone](#) ( **std::string** &timezone)
- Get device timezone in IANA format.*
- virtual bool [on\\_set\\_timezone](#) ( **std::string** timezone)
- Set device timezone in IANA format.*
- virtual bool [on\\_get\\_memorycard\\_info](#) (proto::event\_object::memorycard\_info\_object &info)
- Get memory card information, If this callback returned false or if `info` status not equal to [proto::MCS\\_NORMAL](#), the recording will not be started, i.e.*
- virtual bool [on\\_cam\\_upgrade\\_firmware](#) (const **std::string** &firmware)
- Firmware upgrade.*
- virtual bool [on\\_audio\\_file\\_play](#) (const **std::string** audio\_file\_data, const **std::string** filename)
- Audio file play.*
- virtual bool [on\\_trigger\\_event](#) (proto::event\_object &event)
- virtual bool [on\\_set\\_audio\\_detection](#) (const proto::audio\_detection\_config &conf)
- virtual bool [on\\_get\\_audio\\_detection](#) (proto::audio\_detection\_config &conf)

### 10.9.1 Detailed Description

VXG Cloud manager common callbacks class.

Definition at line 17 of file callback.h.

### 10.9.2 Member Typedef Documentation

#### 10.9.2.1 ptr

```
typedef std::unique_ptr<callback> vxg::cloud::agent::callback::ptr
```

**std::unique\_ptr** to callback

Definition at line 20 of file callback.h.

## 10.9.3 Member Function Documentation

### 10.9.3.1 on\_audio\_file\_play()

```
virtual bool vxg::cloud::agent::callback::on_audio_file_play (
    const std::string audio_file_data,
    const std::string filename ) [inline], [virtual]
```

Audio file play.

#### Parameters

in	<i>audio_file</i>	Audio file binary data.
in	<i>audio_file_format</i>	Audio file data format.

#### Returns

true if firmware upgrade was successful.

false if firmware upgrade failed.

Definition at line 309 of file callback.h.

### 10.9.3.2 on\_bye()

```
virtual void vxg::cloud::agent::callback::on_bye (
    proto::command::bye_reason reason ) [pure virtual]
```

VXG Cloud Bye command callback.

#### Parameters

<i>reason</i>	bye reason
---------------	------------

### 10.9.3.3 on\_cam\_ptz()

```
virtual bool vxg::cloud::agent::callback::on_cam_ptz (
    proto::ptz_command & command ) [inline], [virtual]
```

PTZ command.

**Parameters**

<i>in</i>	<i>command</i>	ptz command
-----------	----------------	-------------

**Returns**

true success  
false PTZ command failure

Definition at line 163 of file callback.h.

**10.9.3.4 on\_cam\_ptz\_preset()**

```
virtual bool vxg::cloud::agent::callback::on_cam_ptz_preset (  
    proto::ptz_preset & preset_op ) [inline], [virtual]
```

PTZ preset command.

**Parameters**

<i>in, out</i>	<i>preset_op</i>	ptz preset operation, if operation is <a href="#">proto::PA_CREATE</a> the callee should fill the token.
----------------	------------------	--

**Returns**

true PTZ preset operation success  
false PTZ preset operation failure

Definition at line 175 of file callback.h.

**10.9.3.5 on\_cam\_upgrade\_firmware()**

```
virtual bool vxg::cloud::agent::callback::on_cam_upgrade_firmware (  
    const std::string & firmware ) [inline], [virtual]
```

Firmware upgrade.

**Parameters**

<i>in</i>	<i>firmware</i>	Firmware binary data.
-----------	-----------------	-----------------------

**Returns**

true if firmware upgrade was successful.  
false if firmware upgrade failed.

Definition at line 299 of file callback.h.

#### 10.9.3.6 on\_get\_audio\_detection()

```
virtual bool vxg::cloud::agent::callback::on_get_audio_detection (
    proto::audio_detection_config & conf ) [inline], [virtual]
```

Definition at line 326 of file callback.h.

#### 10.9.3.7 on\_get\_cam\_audio\_config()

```
virtual bool vxg::cloud::agent::callback::on_get_cam_audio_config (
    proto::audio_config & config ) [inline], [virtual]
```

Get audio input configuration.

##### Parameters

out	<i>config</i>	audio input config
-----	---------------	--------------------

##### Returns

true get audio input configuration success  
false get audio input configuration failed

Definition at line 127 of file callback.h.

#### 10.9.3.8 on\_get\_cam\_video\_config()

```
virtual bool vxg::cloud::agent::callback::on_get_cam_video_config (
    proto::video_config & config ) [inline], [virtual]
```

Get video image config.

##### Parameters

out	<i>config</i>	video image config
-----	---------------	--------------------

##### Returns

true if get image config success  
false get image config failed



Definition at line 103 of file callback.h.

### 10.9.3.9 on\_get\_log()

```
virtual bool vxg::cloud::agent::callback::on_get_log (
    std::string & log_data ) [inline], [virtual]
```

Get logging data callback.

Cloud API provides the way to request log data using Cloud API

#### Parameters

<i>log_data</i>	log data
-----------------	----------

#### Returns

true on success  
false on failure

Definition at line 65 of file callback.h.

### 10.9.3.10 on\_get\_memorycard\_info()

```
virtual bool vxg::cloud::agent::callback::on_get_memorycard_info (
    proto::event_object::memorycard_info_object & info ) [inline], [virtual]
```

Get memory card information, If this callback returned false or if *info* status not equal to [proto::MCS\\_NORMAL](#), the recording will not be started, i.e.

no agent::media::stream::record\_start() will be called.

#### Parameters

out	<i>info</i>	memorycard info
-----	-------------	-----------------

#### Returns

true if *info* is valid  
false if *info* is not valid

Definition at line 289 of file callback.h.

### 10.9.3.11 on\_get\_motion\_detection\_config()

```
virtual bool vxg::cloud::agent::callback::on_get_motion_detection_config (
    proto::motion_detection_config & config ) [inline], [virtual]
```

Get motion detection configuration.

#### Parameters

out	<i>config</i>	Motion detection config if return value is true
-----	---------------	---

#### Returns

true if *config* is valid  
false if failed to get motion detection config

Definition at line 236 of file callback.h.

### 10.9.3.12 on\_get\_osd\_config()

```
virtual bool vxg::cloud::agent::callback::on_get_osd_config (
    proto::osd_config & config ) [inline], [virtual]
```

Get OSD config.

#### Parameters

out	<i>config</i>	OSD config
-----	---------------	------------

#### Returns

true OSD config get success, *config* is valid  
false OSD config get failure, *config* should not be used

Definition at line 187 of file callback.h.

### 10.9.3.13 on\_get\_ptz\_config()

```
virtual bool vxg::cloud::agent::callback::on_get_ptz_config (
    proto::ptz_config & config ) [inline], [virtual]
```

Get PTZ config.

**Parameters**

out	<i>config</i>	ptz config
-----	---------------	------------

**Returns**

true success  
false Get PTZ config failed

Definition at line 151 of file callback.h.

**10.9.3.14 on\_get\_timezone()**

```
virtual bool vxg::cloud::agent::callback::on_get_timezone (
    std::string & timezone ) [inline], [virtual]
```

Get device timezone in IANA format.

**Parameters**

out	<i>timezone</i>	name in IANA format
-----	-----------------	---------------------

**Returns**

true if *timezone* is valid  
false if *timezone* is not valid

Definition at line 262 of file callback.h.

**10.9.3.15 on\_get\_wifi\_config()**

```
virtual bool vxg::cloud::agent::callback::on_get_wifi_config (
    proto::wifi_config & config ) [inline], [virtual]
```

Get WiFi config.

**Parameters**

out	<i>config</i>	WiFi config
-----	---------------	-------------

**Returns**

true success  
false failed

Definition at line 211 of file callback.h.

#### 10.9.3.16 on\_raw\_msg()

```
virtual bool vxg::cloud::agent::callback::on_raw_msg (
    std::string client_id,
    std::string & data ) [inline], [virtual]
```

raw message callback

##### Parameters

in	<i>client_id</i>	unique id of the client, every raw messages session uses the same unique client_id
in, out	<i>data</i>	raw message payload from client, output value will be sent to the client if return value is true

##### Returns

true raw message handled and reply in the output *data* argument should be sent to the client as reply  
false raw message handling failure, *data* output argument should not be sent to client

Definition at line 53 of file callback.h.

#### 10.9.3.17 on\_registered()

```
virtual void vxg::cloud::agent::callback::on_registered (
    const std::string & sid ) [inline], [virtual]
```

Registration on the Cloud has passed callback.

##### Parameters

<i>sid</i>	Cloud connection session id. Must be saved and provided via the agent::config.cm_register_sid before the next <a href="#">vxg::cloud::agent::manager::start()</a> , otherwise the Cloud will block connection with CONN_CONFLICT for some period of time.
------------	---

Definition at line 37 of file callback.h.

#### 10.9.3.18 on\_set\_audio\_detection()

```
virtual bool vxg::cloud::agent::callback::on_set_audio_detection (
    const proto::audio_detection_config & conf ) [inline], [virtual]
```

Definition at line 320 of file callback.h.

#### 10.9.3.19 on\_set\_cam\_audio\_config()

```
virtual bool vxg::cloud::agent::callback::on_set_cam_audio_config (
    const proto::audio_config & config ) [inline], [virtual]
```

Set audio input/output config.

##### Parameters

<i>config</i>	audio input/output config
---------------	---------------------------

##### Returns

true applied  
false failed to set config

Definition at line 139 of file callback.h.

#### 10.9.3.20 on\_set\_cam\_video\_config()

```
virtual bool vxg::cloud::agent::callback::on_set_cam_video_config (
    const proto::video_config & config ) [inline], [virtual]
```

Set video input config.

##### Parameters

<i>config</i>	video input config
---------------	--------------------

##### Returns

true Video image input config was successfully set  
false Failed to set video input image config

Definition at line 115 of file callback.h.

#### 10.9.3.21 on\_set\_motion\_detection\_config()

```
virtual bool vxg::cloud::agent::callback::on_set_motion_detection_config (
    const proto::motion_detection_config & config ) [inline], [virtual]
```

Set motion detection config.

**Parameters**

in	<i>config</i>	motion detection config
----	---------------	-------------------------

**Returns**

true if `config` was successfully set  
false if failed to set `config`

Definition at line 249 of file `callback.h`.

**10.9.3.22 on\_set\_osd\_config()**

```
virtual bool vxg::cloud::agent::callback::on_set_osd_config (  
    const proto::osd_config & config ) [inline], [virtual]
```

Set OSD config.

**Parameters**

in	<i>config</i>	OSD config
----	---------------	------------

**Returns**

true OSD config was successfully set  
false failed to set OSD config

Definition at line 199 of file `callback.h`.

**10.9.3.23 on\_set\_timezone()**

```
virtual bool vxg::cloud::agent::callback::on_set_timezone (  
    std::string timezone ) [inline], [virtual]
```

Set device timezone in IANA format.

**Parameters**

in	<i>timezone</i>	timezone in IANA format
----	-----------------	-------------------------

**Returns**

true if timezone was successfully set  
false if timezone was not set

Definition at line 274 of file callback.h.

#### 10.9.3.24 on\_set\_wifi\_config()

```
virtual bool vxg::cloud::agent::callback::on_set_wifi_config (
    const proto::wifi\_network & config ) [inline], [virtual]
```

Set WiFi config.

##### Parameters

<i>in</i>	<i>config</i>	WiFi configuration
-----------	---------------	--------------------

##### Returns

true if *config* is valid  
false if *config* is invalid

Definition at line 223 of file callback.h.

#### 10.9.3.25 on\_start\_backward\_audio()

```
virtual bool vxg::cloud::agent::callback::on_start_backward_audio (
    std::string url ) [inline], [virtual]
```

Start backward audio stream.

##### Parameters

<i>url</i>	rtmp url for backward channel, device supports backward audio if <a href="#">on_get_cam_audio_config()</a> set <code>proto::audio_config.caps spkr</code> to true
------------	---

Implementation should start rtmp client by its own, final implementation is also responsible for the demuxing, decoding and rendering of the audio stream.

##### Returns

true on success  
false on failure

Definition at line 81 of file callback.h.

### 10.9.3.26 on\_stop\_backward\_audio()

```
virtual bool vxg::cloud::agent::callback::on_stop_backward_audio (
    std::string url ) [inline], [virtual]
```

Stop backward audio.

#### Parameters

<i>url</i>	backward audio url which was used to start the backward channel
------------	---

Definition at line 92 of file callback.h.

### 10.9.3.27 on\_trigger\_event()

```
virtual bool vxg::cloud::agent::callback::on_trigger_event (
    proto::event_object & event ) [inline], [virtual]
```

Definition at line 315 of file callback.h.

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

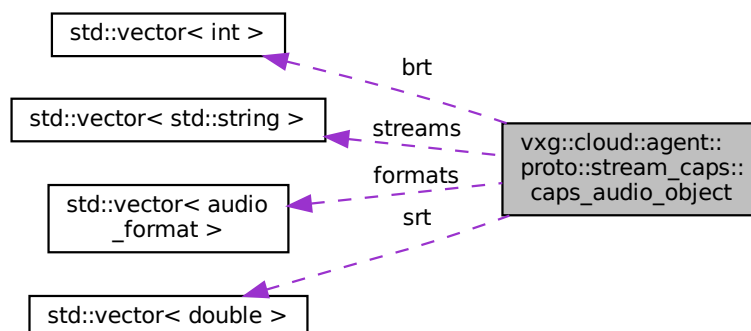
- [callback.h](#)

## 10.10 vxg::cloud::agent::proto::stream\_caps::caps\_audio\_object Struct Reference

Audio streams capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::stream\_caps::caps\_audio\_object:





## Data Fields

- **std::vector< std::string > streams**  
*Mandatory: list of strings, audio ES that are covered by this capability config.*
- **std::vector< audio\_format > formats**  
*Mandatory: list of string, supported audio formats; currently only "AAC" and "G711U" is supported.*
- **std::vector< int > brt**  
*Mandatory: [min:int, max:int, step:int], range of bitrates, kbps.*
- **std::vector< double > srt**  
*Mandatory: list of float, supported samplersates.*

### 10.10.1 Detailed Description

Audio streams capabilities.

Definition at line 247 of file caps.h.

### 10.10.2 Field Documentation

#### 10.10.2.1 brt

```
std::vector<int> vxg::cloud::agent::proto::stream_caps::caps_audio_object::brt
```

Mandatory: [min:int, max:int, step:int], range of bitrates, kbps.

Definition at line 259 of file caps.h.

#### 10.10.2.2 formats

```
std::vector<audio_format> vxg::cloud::agent::proto::stream_caps::caps_audio_object::formats
```

Mandatory: list of string, supported audio formats; currently only "AAC" and "G711U" is supported.

Definition at line 255 of file caps.h.

#### 10.10.2.3 srt

```
std::vector<double> vxg::cloud::agent::proto::stream_caps::caps_audio_object::srt
```

Mandatory: list of float, supported samplersates.

Definition at line 263 of file caps.h.

### 10.10.2.4 streams

```
std::vector< std::string> vxg::cloud::agent::proto::stream_caps::caps_audio_object::streams
```

Mandatory: list of strings, audio ES that are covered by this capability config.

Definition at line 250 of file caps.h.

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

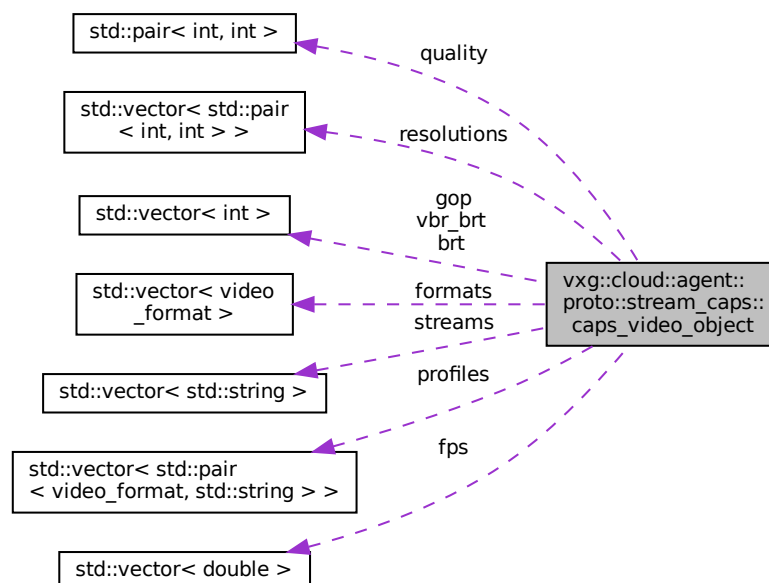
- [caps.h](#)

## 10.11 vxg::cloud::agent::proto::stream\_caps::caps\_video\_object Struct Reference

Video streams capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::stream\_caps::caps\_video\_object:



## Data Fields

- **std::vector< std::string > streams**  
Mandatory: list of strings, video ES that are covered by this capability config.
- **std::vector< video\_format > formats**  
Mandatory: list of string, supported video formats; currently only "H.264" is supported.
- **std::vector< std::pair< video\_format, std::string > > profiles**  
Optional: list of pairs [string (format), string (profile)], list of profiles for formats (when they have).
- **std::vector< std::pair< int, int > > resolutions**  
Mandatory: list of pairs [int (horz), int (vert)], - supported video resolutions.
- **std::vector< double > fps**  
Mandatory: list of float, supported framerates.
- bool **vbr**  
Mandatory: VBR is supported.
- **std::pair< int, int > quality**  
Optional: [min:int, max:int], range of quality for VBR.
- **std::vector< int > gop**  
Mandatory: gop: [min:int, max:int, step:int], range of gop sizes.
- **std::vector< int > brt**  
Mandatory: [min:int, max:int, step:int], range of bitrates, kbps.
- **std::vector< int > vbr\_brt**  
Optional: [min:int, max:int, step:int], range of bitrates, kbps.
- bool **smoothing**  
Optional: True when stream smoothing can be controlled.

### 10.11.1 Detailed Description

Video streams capabilities.

Definition at line 177 of file caps.h.

### 10.11.2 Field Documentation

#### 10.11.2.1 brt

```
std::vector<int> vxg::cloud::agent::proto::stream_caps::caps_video_object::brt
```

Mandatory: [min:int, max:int, step:int], range of bitrates, kbps.

Definition at line 219 of file caps.h.

### 10.11.2.2 formats

```
std::vector<video_format> vxg::cloud::agent::proto::stream_caps::caps_video_object::formats
```

Mandatory: list of string, supported video formats; currently only "H.264" is supported.

Definition at line 185 of file caps.h.

### 10.11.2.3 fps

```
std::vector<double> vxg::cloud::agent::proto::stream_caps::caps_video_object::fps
```

Mandatory: list of float, supported framerates.

Definition at line 203 of file caps.h.

### 10.11.2.4 gop

```
std::vector<int> vxg::cloud::agent::proto::stream_caps::caps_video_object::gop
```

Mandatory: gop: [min:int, max:int, step:int], range of gop sizes.

Definition at line 215 of file caps.h.

### 10.11.2.5 profiles

```
std::vector< std::pair<video_format, std::string> > vxg::cloud::agent::proto::stream_caps↵  
::caps_video_object::profiles
```

Optional: list of pairs [string (format), string (profile)], list of profiles for formats (when they have).

Empty list means – color selection is not supported. "format" - one of listed in "formats" names. "profile"

- name of profile. Example: [{"H.264", "Baseline"}, {"H.264", "Main"}, {"H.264", "High"}]

Definition at line 194 of file caps.h.

### 10.11.2.6 quality

```
std::pair<int, int> vxg::cloud::agent::proto::stream_caps::caps_video_object::quality
```

Optional: [min:int, max:int], range of quality for VBR.

Definition at line 211 of file caps.h.

### 10.11.2.7 resolutions

```
std::vector< std::pair<int, int> > vxg::cloud::agent::proto::stream_caps::caps_video_↵  
object::resolutions
```

Mandatory: list of pairs [int (horz), int (vert)], - supported video resolutions.

Definition at line 199 of file caps.h.

### 10.11.2.8 smoothing

```
bool vxg::cloud::agent::proto::stream_caps::caps_video_object::smoothing
```

Optional: True when stream smoothing can be controlled.

Definition at line 227 of file caps.h.

### 10.11.2.9 streams

```
std::vector< std::string> vxg::cloud::agent::proto::stream_caps::caps_video_object::streams
```

Mandatory: list of strings, video ES that are covered by this capability config.

Definition at line 180 of file caps.h.

### 10.11.2.10 vbr

```
bool vxg::cloud::agent::proto::stream_caps::caps_video_object::vbr
```

Mandatory: VBR is supported.

Definition at line 207 of file caps.h.

### 10.11.2.11 vbr\_brt

```
std::vector<int> vxg::cloud::agent::proto::stream_caps::caps_video_object::vbr_brt
```

Optional: [min:int, max:int, step:int], range of bitrates, kbps.

Definition at line 223 of file caps.h.

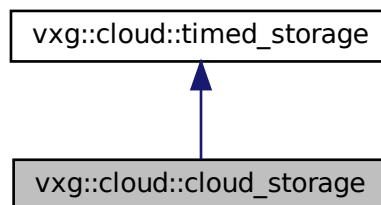
The documentation for this struct was generated from the following file:

- [caps.h](#)

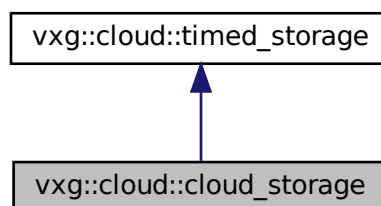
## 10.12 vxg::cloud::cloud\_storage Class Reference

```
#include <agent/timeline.h>
```

Inheritance diagram for vxg::cloud::cloud\_storage:



Collaboration diagram for vxg::cloud::cloud\_storage:



### Public Member Functions

- `cloud_storage` (const agent::proto::access\_token &token, transport::libwebsockets::http::ptr http=nullptr)
- virtual `~cloud_storage` ()
- virtual `std::vector< item_ptr > list` (cloud::time start, cloud::time stop) override
- virtual bool `load` (item\_ptr item) override
- bool `store` (item\_ptr item)
- virtual void `erase` (item\_ptr)

### Additional Inherited Members

#### 10.12.1 Detailed Description

Definition at line 284 of file timeline.h.

## 10.12.2 Constructor & Destructor Documentation

### 10.12.2.1 cloud\_storage()

```
vxg::cloud::cloud_storage::cloud_storage (
    const agent::proto::access_token & token,
    transport::libwebsockets::http::ptr http = nullptr ) [inline]
```

Definition at line 291 of file timeline.h.

### 10.12.2.2 ~cloud\_storage()

```
virtual vxg::cloud::cloud_storage::~~cloud_storage ( ) [inline], [virtual]
```

Definition at line 308 of file timeline.h.

## 10.12.3 Member Function Documentation

### 10.12.3.1 erase()

```
virtual void vxg::cloud::cloud_storage::erase (
    item_ptr ) [inline], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 453 of file timeline.h.

### 10.12.3.2 list()

```
virtual std::vector<item_ptr> vxg::cloud::cloud_storage::list (
    cloud::time start,
    cloud::time stop ) [inline], [override], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 310 of file timeline.h.

### 10.12.3.3 load()

```
virtual bool vxg::cloud::cloud_storage::load (
    item_ptr item ) [inline], [override], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 344 of file timeline.h.

### 10.12.3.4 store()

```
bool vxg::cloud::cloud_storage::store (
    item_ptr item ) [inline], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 382 of file timeline.h.

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

- [timeline.h](#)

## 10.13 vxg::cloud::agent::event\_manager::config Struct Reference

```
#include <agent/event-manager.h>
```

### Data Fields

- bool [attach\\_qos\\_report\\_to\\_motion](#)  
*Attach qos report as motion event's meta.*
- bool [send\\_qos\\_report\\_as\\_separate\\_event](#)  
*Periodically send qos-report event instead of attaching qos to motion event.*
- size\_t [send\\_qos\\_report\\_period\\_sec](#)  
*Period between the qos-report events in seconds.*
- bool [stateful\\_event\\_continuation\\_kick\\_snapshot](#)  
*Attach snapshot to event's state emulation dummy event.*

### 10.13.1 Detailed Description

Definition at line 15 of file event-manager.h.

### 10.13.2 Field Documentation



### 10.13.2.1 attach\_qos\_report\_to\_motion

```
bool vxg::cloud::agent::event_manager::config::attach_qos_report_to_motion
```

Attach qos report as motion event's meta.

Definition at line 17 of file event-manager.h.

### 10.13.2.2 send\_qos\_report\_as\_separate\_event

```
bool vxg::cloud::agent::event_manager::config::send_qos_report_as_separate_event
```

Periodically send qos-report event instead of attaching qos to motion event.

Definition at line 20 of file event-manager.h.

### 10.13.2.3 send\_qos\_report\_period\_sec

```
size_t vxg::cloud::agent::event_manager::config::send_qos_report_period_sec
```

Period between the qos-report events in seconds.

Definition at line 22 of file event-manager.h.

### 10.13.2.4 stateful\_event\_continuation\_kick\_snapshot

```
bool vxg::cloud::agent::event_manager::config::stateful_event_continuation_kick_snapshot
```

Attach snapshot to event's state emulation dummy event.

Stateful events emulation kicks Cloud with event of same type every 10 seconds during stateful event state is active. This flag enables snapshots for such events. Snapshot will be attached only if original event has snapshot flag enabled in its caps and settings.

Definition at line 29 of file event-manager.h.

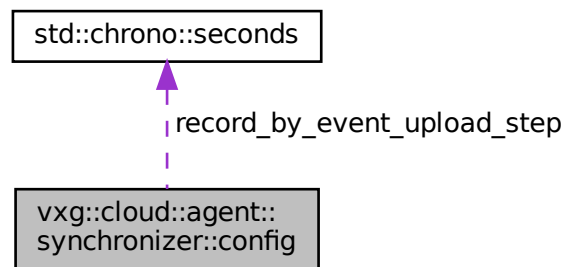
The documentation for this struct was generated from the following file:

- [event-manager.h](#)

## 10.14 vxg::cloud::agent::synchronizer::config Struct Reference

```
#include <agent/timeline-synchronizer.h>
```

Collaboration diagram for vxg::cloud::agent::synchronizer::config:



### Data Fields

- **std::chrono::seconds** [record\\_by\\_event\\_upload\\_step](#)  
*by event recording segment duration*

### 10.14.1 Detailed Description

Definition at line 20 of file timeline-synchronizer.h.

### 10.14.2 Field Documentation

#### 10.14.2.1 record\_by\_event\_upload\_step

```
std::chrono::seconds vxg::cloud::agent::synchronizer::config::record_by_event_upload_step
```

by event recording segment duration

Definition at line 22 of file timeline-synchronizer.h.

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

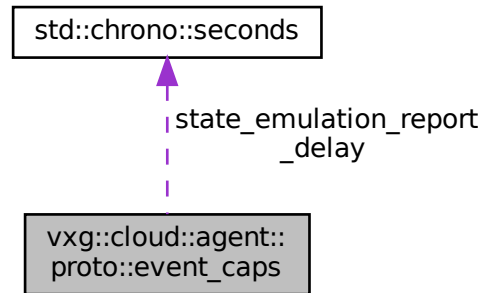
- [timeline-synchronizer.h](#)

## 10.15 vxg::cloud::agent::proto::event\_caps Struct Reference

Events capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::event\_caps:



### Data Fields

- bool [stream](#)  
*stream: bool, event can generate stream start*
- bool [snapshot](#)  
*snapshot: bool, event is sent with snapshot*
- bool [periodic](#)  
*periodic: optional bool, the event is a periodic event (camera generates and processes it using specified time interval)*
- bool [trigger](#)  
*trigger: optional bool, the event can be triggered externally, using 6.7*
- bool [stateful](#)
- bool [state\\_emulation](#)
- **std::chrono::seconds** [state\\_emulation\\_report\\_delay](#)
- bool [internal\\_hidden](#)  
*Library internal hidden event, not reported to the Cloud.*

### 10.15.1 Detailed Description

Events capabilities.

Definition at line 438 of file caps.h.

### 10.15.2 Field Documentation

#### 10.15.2.1 internal\_hidden

```
bool vxg::cloud::agent::proto::event_caps::internal_hidden
```

Library internal hidden event, not reported to the Cloud.

Definition at line 475 of file caps.h.

#### 10.15.2.2 periodic

```
bool vxg::cloud::agent::proto::event_caps::periodic
```

periodic: optional bool, the event is a periodic event (camera generates and processes it using specified time interval)

Definition at line 447 of file caps.h.

#### 10.15.2.3 snapshot

```
bool vxg::cloud::agent::proto::event_caps::snapshot
```

snapshot: bool, event is sent with snapshot

Definition at line 443 of file caps.h.

#### 10.15.2.4 state\_emulation

```
bool vxg::cloud::agent::proto::event_caps::state_emulation
```

Definition at line 471 of file caps.h.

#### 10.15.2.5 state\_emulation\_report\_delay

```
std::chrono::seconds vxg::cloud::agent::proto::event_caps::state_emulation_report_delay
```

Definition at line 472 of file caps.h.

### 10.15.2.6 stateful

```
bool vxg::cloud::agent::proto::event_caps::stateful
```

Definition at line 469 of file caps.h.

### 10.15.2.7 stream

```
bool vxg::cloud::agent::proto::event_caps::stream
```

stream: bool, event can generate stream start

Definition at line 440 of file caps.h.

### 10.15.2.8 trigger

```
bool vxg::cloud::agent::proto::event_caps::trigger
```

trigger: optional bool, the event can be triggered externally, using 6.7

Definition at line 450 of file caps.h.

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

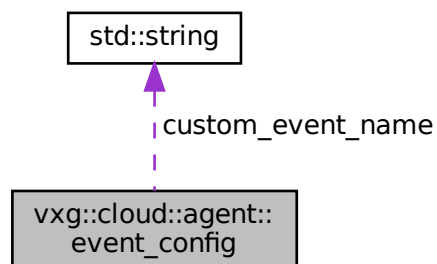
- [caps.h](#)

## 10.16 vxg::cloud::agent::event\_config Struct Reference

Event config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::event\_config:



## Public Member Functions

- bool `name_eq` (const `event_config` &r) const  
*Is-equal predicate based on event's name only.*
- bool `caps_eq` (const `event_config` &r) const  
*Is-equal predicate based on event's caps.*
- `std::string name` () const

## Data Fields

- event\_type `event`  
*event: string, event name, see 6.1 Events naming for details*
- `std::string custom_event_name`  
*Custom event name, used if event set to event\_type::ET\_CUSTOM.*
- bool `active`  
*active: bool, event is active; if not set, corresponding events will not be sent*
- bool `stream`  
*stream: bool, start stream when event happens*
- bool `snapshot`  
*snapshot: bool, generate snapshot when event happens*
- int `period`  
*period: optional int, an interval between periodic events, seconds*
- event\_caps `caps`  
*Event capabilities.*

### 10.16.1 Detailed Description

Event config.

Definition at line 894 of file config.h.

### 10.16.2 Member Function Documentation

#### 10.16.2.1 caps\_eq()

```
bool vxg::cloud::agent::event_config::caps_eq (
    const event_config & r ) const [inline]
```

Is-equal predicate based on event's caps.

Parameters

<i>r</i>	
----------	--

**Returns**

true Compared configs have equal caps.  
false Compared configs have non-equal caps.

Definition at line 934 of file config.h.

**10.16.2.2 name()**

```
std::string vxg::cloud::agent::event_config::name ( ) const [inline]
```

Definition at line 938 of file config.h.

**10.16.2.3 name\_eq()**

```
bool vxg::cloud::agent::event_config::name_eq (
    const event_config & r ) const [inline]
```

Is-equal predicate based on event's name only.

**Parameters**

<i>r</i>	
----------	--

**Returns**

true Compared configs are for the event with equal names.  
false Compared configs are for events with non-equal names.

Definition at line 925 of file config.h.

**10.16.3 Field Documentation****10.16.3.1 active**

```
bool vxg::cloud::agent::event_config::active
```

active: bool, event is active; if not set, corresponding events will not be sent

Definition at line 903 of file config.h.

### 10.16.3.2 caps

```
event_caps vxg::cloud::agent::event_config::caps
```

Event capabilities.

Definition at line 918 of file config.h.

### 10.16.3.3 custom\_event\_name

```
std::string vxg::cloud::agent::event_config::custom_event_name
```

Custom event name, used if event set to event\_type::ET\_CUSTOM.

Definition at line 899 of file config.h.

### 10.16.3.4 event

```
event_type vxg::cloud::agent::event_config::event
```

event: string, event name, see 6.1 Events naming for details

Definition at line 896 of file config.h.

### 10.16.3.5 period

```
int vxg::cloud::agent::event_config::period
```

period: optional int, an interval between periodic events, seconds

Definition at line 912 of file config.h.

### 10.16.3.6 snapshot

```
bool vxg::cloud::agent::event_config::snapshot
```

snapshot: bool, generate snapshot when event happens

Definition at line 909 of file config.h.



### 10.16.3.7 stream

bool vxg::cloud::agent::event\_config::stream

stream: bool, start stream when event happens

Definition at line 906 of file config.h.

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

- [config.h](#)

## 10.17 vxg::cloud::agent::event\_manager Class Reference

```
#include <agent/event-manager.h>
```

### Data Structures

- struct [config](#)
- struct [event\\_state\\_report\\_cb](#)

### Public Types

- using [event\\_state\\_report\\_cb\\_ptr](#) = **std::shared\_ptr**< [event\\_manager::event\\_state\\_report\\_cb](#) >
- using [handle\\_event\\_payload\\_cb](#) = **std::function**< bool([agent::proto::event\\_object](#) &, bool)>

### Public Member Functions

- [event\\_manager](#) (const [event\\_manager::config](#) &config, **std::vector**< [agent::event\\_stream::ptr](#) > event\_streams, [event\\_state\\_report\\_cb\\_ptr](#) sync\_cb\_ptr, [handle\\_event\\_payload\\_cb](#))
- [~event\\_manager](#) ()
- void [start](#) ()
- void [stop](#) ()
- bool [set\\_events](#) (const [agent::proto::events\\_config](#) &config)
- bool [get\\_events](#) ([agent::proto::events\\_config](#) &config)
- bool [notify\\_event](#) (const [agent::proto::event\\_object](#) &event)
- bool [trigger\\_event](#) (const **std::string** &event, const [json](#) &meta, [cloud::time](#) time)

### 10.17.1 Detailed Description

Definition at line 11 of file event-manager.h.

### 10.17.2 Member Typedef Documentation

### 10.17.2.1 event\_state\_report\_cb\_ptr

```
using vxg::cloud::agent::event_manager::event_state_report_cb_ptr = std::shared_ptr<event_manager::event_sta
```

Definition at line 65 of file event-manager.h.

### 10.17.2.2 handle\_event\_payload\_cb

```
using vxg::cloud::agent::event_manager::handle_event_payload_cb = std::function<bool (agent↔  
::proto::event_object&, bool)>
```

Definition at line 67 of file event-manager.h.

## 10.17.3 Constructor & Destructor Documentation

### 10.17.3.1 event\_manager()

```
vxg::cloud::agent::event_manager::event_manager (
    const event_manager::config & config,
    std::vector< agent::event_stream::ptr > event_streams,
    event_state_report_cb_ptr sync_cb_ptr,
    handle_event_payload_cb )
```

### 10.17.3.2 ~event\_manager()

```
vxg::cloud::agent::event_manager::~event_manager ( )
```

## 10.17.4 Member Function Documentation

### 10.17.4.1 get\_events()

```
bool vxg::cloud::agent::event_manager::get_events (
    agent::proto::events_config & config )
```

#### 10.17.4.2 notify\_event()

```
bool vxg::cloud::agent::event_manager::notify_event (
    const agent::proto::event_object & event )
```

#### 10.17.4.3 set\_events()

```
bool vxg::cloud::agent::event_manager::set_events (
    const agent::proto::events_config & config )
```

#### 10.17.4.4 start()

```
void vxg::cloud::agent::event_manager::start ( )
```

#### 10.17.4.5 stop()

```
void vxg::cloud::agent::event_manager::stop ( )
```

#### 10.17.4.6 trigger\_event()

```
bool vxg::cloud::agent::event_manager::trigger_event (
    const std::string & event,
    const json & meta,
    cloud::time time )
```

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

- [event-manager.h](#)

## 10.18 vxg::cloud::agent::event\_state Class Reference

```
#include <agent/event-state.h>
```

### Data Structures

- struct [event\\_state\\_changed\\_cb](#)

## Public Types

- enum `stream_delivery_mode` { `SDM_NONE`, `SDM_UPLOAD`, `SDM_STREAM` }
- using `event_state_changed_cb_ptr` = `std::shared_ptr<event_state_changed_cb>`

## Public Member Functions

- `event_state` ()
- `!`
- `event_state` (const agent::proto::event\_config &event\_conf, `event_state_changed_cb_ptr` state\_changed\_cb, transport::timed\_callback\_ptr timed\_cb)
- `~event_state` ()
- `event_state` (const `event_state` &r)
- `event_state` & `operator=` (`event_state` r) noexcept
- void `start` (cloud::time start, cloud::time stop=utils::time::null())
- void `stop` (cloud::time time)
- bool `active` () const
- bool `stateful` () const
- bool `need_record` () const
- cloud::time `start` () const
- cloud::time `stop` () const
- const agent::proto::event\_config & `config` () const

## Friends

- void `swap` (`event_state` &l, `event_state` &r)

### 10.18.1 Detailed Description

Definition at line 11 of file event-state.h.

### 10.18.2 Member Typedef Documentation

#### 10.18.2.1 event\_state\_changed\_cb\_ptr

```
using vxg::cloud::agent::event_state::event_state_changed_cb_ptr = std::shared_ptr<event_state_changed_cb>
```

Definition at line 42 of file event-state.h.

### 10.18.3 Member Enumeration Documentation

#### 10.18.3.1 stream\_delivery\_mode

```
enum vxg::cloud::agent::event_state::stream_delivery_mode
```

## Enumerator

SDM_NONE	
SDM_UPLOAD	
SDM_STREAM	

Definition at line 29 of file event-state.h.

## 10.18.4 Constructor & Destructor Documentation

### 10.18.4.1 event\_state() [1/3]

```
vxg::cloud::agent::event_state::event_state ( ) [inline]
```

!

Definition at line 98 of file event-state.h.

### 10.18.4.2 event\_state() [2/3]

```
vxg::cloud::agent::event_state::event_state (
    const agent::proto::event_config & event_conf,
    event_state_changed_cb_ptr state_changed_cb,
    transport::timed_callback_ptr timed_cb ) [inline]
```

Definition at line 99 of file event-state.h.

### 10.18.4.3 ~event\_state()

```
vxg::cloud::agent::event_state::~~event_state ( ) [inline]
```

Definition at line 107 of file event-state.h.

### 10.18.4.4 event\_state() [3/3]

```
vxg::cloud::agent::event_state::event_state (
    const event_state & r ) [inline]
```

Definition at line 129 of file event-state.h.

## 10.18.5 Member Function Documentation

### 10.18.5.1 active()

```
bool vxg::cloud::agent::event_state::active ( ) const [inline]
```

Definition at line 193 of file event-state.h.

### 10.18.5.2 config()

```
const agent::proto::event_config& vxg::cloud::agent::event_state::config ( ) const [inline]
```

Definition at line 198 of file event-state.h.

### 10.18.5.3 need\_record()

```
bool vxg::cloud::agent::event_state::need_record ( ) const [inline]
```

Definition at line 195 of file event-state.h.

### 10.18.5.4 operator=()

```
event_state& vxg::cloud::agent::event_state::operator= (   
    event_state r ) [inline], [noexcept]
```

Definition at line 146 of file event-state.h.

### 10.18.5.5 start() [1/2]

```
cloud::time vxg::cloud::agent::event_state::start ( ) const [inline]
```

Definition at line 196 of file event-state.h.

### 10.18.5.6 start() [2/2]

```
void vxg::cloud::agent::event_state::start (
    cloud::time start,
    cloud::time stop = utils::time::null() ) [inline]
```

Definition at line 152 of file event-state.h.

### 10.18.5.7 stateful()

```
bool vxg::cloud::agent::event_state::stateful ( ) const [inline]
```

Definition at line 194 of file event-state.h.

### 10.18.5.8 stop() [1/2]

```
cloud::time vxg::cloud::agent::event_state::stop ( ) const [inline]
```

Definition at line 197 of file event-state.h.

### 10.18.5.9 stop() [2/2]

```
void vxg::cloud::agent::event_state::stop (
    cloud::time time ) [inline]
```

Definition at line 182 of file event-state.h.

## 10.18.6 Friends And Related Function Documentation

### 10.18.6.1 swap

```
void swap (
    event_state & l,
    event_state & r ) [friend]
```

Definition at line 136 of file event-state.h.

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

- [event-state.h](#)

## 10.19 vxg::cloud::agent::event\_state::event\_state\_changed\_cb Struct Reference

```
#include <agent/event-state.h>
```

### Public Member Functions

- [event\\_state\\_changed\\_cb](#) ()
- virtual [~event\\_state\\_changed\\_cb](#) ()
- virtual void [on\\_started](#) (const [event\\_state](#) &state, const [cloud::time](#) &)
- virtual void [on\\_stopped](#) (const [event\\_state](#) &state, const [cloud::time](#) &)
- virtual void [on\\_ongoing](#) (const [event\\_state](#) &state, const [cloud::time](#) &)
- virtual void [on\\_triggered](#) (const [event\\_state](#) &state, const [cloud::time](#) &)

### 10.19.1 Detailed Description

Definition at line 30 of file event-state.h.

### 10.19.2 Constructor & Destructor Documentation

#### 10.19.2.1 event\_state\_changed\_cb()

```
vxg::cloud::agent::event_state::event_state_changed_cb::event_state_changed_cb ( ) [inline]
```

Definition at line 31 of file event-state.h.

#### 10.19.2.2 ~event\_state\_changed\_cb()

```
virtual vxg::cloud::agent::event_state::event_state_changed_cb::~~event_state_changed_cb ( )  
[inline], [virtual]
```

Definition at line 32 of file event-state.h.

### 10.19.3 Member Function Documentation



### 10.19.3.1 on\_ongoing()

```
virtual void vxg::cloud::agent::event_state::event_state_changed_cb::on_ongoing (
    const event_state & state,
    const cloud::time & ) [inline], [virtual]
```

Definition at line 37 of file event-state.h.

### 10.19.3.2 on\_started()

```
virtual void vxg::cloud::agent::event_state::event_state_changed_cb::on_started (
    const event_state & state,
    const cloud::time & ) [inline], [virtual]
```

Definition at line 35 of file event-state.h.

### 10.19.3.3 on\_stopped()

```
virtual void vxg::cloud::agent::event_state::event_state_changed_cb::on_stopped (
    const event_state & state,
    const cloud::time & ) [inline], [virtual]
```

Definition at line 36 of file event-state.h.

### 10.19.3.4 on\_triggered()

```
virtual void vxg::cloud::agent::event_state::event_state_changed_cb::on_triggered (
    const event_state & state,
    const cloud::time & ) [inline], [virtual]
```

Definition at line 39 of file event-state.h.

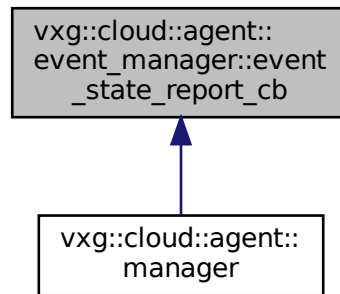
The documentation for this struct was generated from the following file:

- [event-state.h](#)

## 10.20 vxg::cloud::agent::event\_manager::event\_state\_report\_cb Struct Reference

```
#include <agent/event-manager.h>
```

Inheritance diagram for vxg::cloud::agent::event\_manager::event\_state\_report\_cb:



### Public Member Functions

- [event\\_state\\_report\\_cb](#) ()
- virtual [~event\\_state\\_report\\_cb](#) ()
- virtual void [on\\_event\\_start](#) (const [event\\_state](#) &state, const [cloud::time](#) &start)
- virtual void [on\\_event\\_stop](#) (const [event\\_state](#) &state, const [cloud::time](#) &stop)
- virtual void [on\\_event\\_trigger](#) (const [event\\_state](#) &state, const [cloud::time](#) &t)
- virtual void [on\\_event\\_continue](#) (const [event\\_state](#) &state, const [cloud::time](#) &t)
- virtual [std::shared\\_ptr](#)< void > [on\\_need\\_stream\\_sync\\_start](#) (const [event\\_state](#) &state, const [cloud::time](#) &start)
- virtual void [on\\_need\\_stream\\_sync\\_stop](#) (const [event\\_state](#) &state, const [cloud::time](#) &stop, [std::shared\\_ptr](#)< void > userdata)
- virtual [std::shared\\_ptr](#)< void > [on\\_need\\_stream\\_sync\\_continue](#) (const [event\\_state](#) &state, const [cloud::time](#) &t, [std::shared\\_ptr](#)< void > userdata)

### 10.20.1 Detailed Description

Definition at line 32 of file event-manager.h.

### 10.20.2 Constructor & Destructor Documentation

### 10.20.2.1 event\_state\_report\_cb()

```
vxg::cloud::agent::event_manager::event_state_report_cb::event_state_report_cb ( ) [inline]
```

Definition at line 33 of file event-manager.h.

### 10.20.2.2 ~event\_state\_report\_cb()

```
virtual vxg::cloud::agent::event_manager::event_state_report_cb::~~event_state_report_cb ( )  
[inline], [virtual]
```

Definition at line 34 of file event-manager.h.

## 10.20.3 Member Function Documentation

### 10.20.3.1 on\_event\_continue()

```
virtual void vxg::cloud::agent::event_manager::event_state_report_cb::on_event_continue (   
    const event_state & state,  
    const cloud::time & t ) [inline], [virtual]
```

Definition at line 45 of file event-manager.h.

### 10.20.3.2 on\_event\_start()

```
virtual void vxg::cloud::agent::event_manager::event_state_report_cb::on_event_start (   
    const event_state & state,  
    const cloud::time & start ) [inline], [virtual]
```

Definition at line 36 of file event-manager.h.

### 10.20.3.3 on\_event\_stop()

```
virtual void vxg::cloud::agent::event_manager::event_state_report_cb::on_event_stop (   
    const event_state & state,  
    const cloud::time & stop ) [inline], [virtual]
```

Definition at line 39 of file event-manager.h.

### 10.20.3.4 on\_event\_trigger()

```
virtual void vxg::cloud::agent::event_manager::event_state_report_cb::on_event_trigger (
    const event_state & state,
    const cloud::time & t ) [inline], [virtual]
```

Definition at line 42 of file event-manager.h.

### 10.20.3.5 on\_need\_stream\_sync\_continue()

```
virtual std::shared_ptr<void> vxg::cloud::agent::event_manager::event_state_report_cb::on_↵
need_stream_sync_continue (
    const event_state & state,
    const cloud::time & t,
    std::shared_ptr< void > userdata ) [inline], [virtual]
```

Definition at line 57 of file event-manager.h.

### 10.20.3.6 on\_need\_stream\_sync\_start()

```
virtual std::shared_ptr<void> vxg::cloud::agent::event_manager::event_state_report_cb::on_↵
need_stream_sync_start (
    const event_state & state,
    const cloud::time & start ) [inline], [virtual]
```

Definition at line 48 of file event-manager.h.

### 10.20.3.7 on\_need\_stream\_sync\_stop()

```
virtual void vxg::cloud::agent::event_manager::event_state_report_cb::on_need_stream_sync_stop
(
    const event_state & state,
    const cloud::time & stop,
    std::shared_ptr< void > userdata ) [inline], [virtual]
```

Definition at line 54 of file event-manager.h.

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

- [event-manager.h](#)

## 10.21 vxg::cloud::agent::event\_stream Class Reference

Event stream, abstract class for event generation.

```
#include <agent/event-stream.h>
```

## Public Types

- typedef `std::shared_ptr< event_stream > ptr`  
*std::shared\_ptr to event\_stream*

## Public Member Functions

- `event_stream ( std::string name)`  
*Construct a new event stream object.*
- virtual `~event_stream ()`
- bool `notify (proto::event_object event)`  
*Callback should be called to notify event.*
- virtual bool `start ()=0`  
*Start events generation, called by internal code when the events generation requested by the VXG Cloud.*
- virtual void `stop ()=0`  
*Stop events generation.*
- virtual bool `get_events ( std::vector< proto::event_config > &configs)=0`  
*Get the events configs list This method should update config object and add all configurations for the events provided by this event stream.*
- virtual bool `set_events (const std::vector< proto::event_config > &config)=0`  
*Set the events configuration.*
- virtual bool `trigger_event (proto::event_object &event)`  
*Trigger event provided by event\_stream If get\_events() returned event config with proto::event\_config.caps.trigger == true and this event was triggered via the Cloud API this method will be called.*
- virtual bool `set_trigger_recording (bool enabled, int pre, int post)=0`  
*Turn on/off the event\_stream triggered recording and pre/post recording time.*
- virtual bool `init ()=0`
- virtual void `finit ()=0`

### 10.21.1 Detailed Description

Event stream, abstract class for event generation.

Definition at line 13 of file event-stream.h.

### 10.21.2 Member Typedef Documentation

#### 10.21.2.1 ptr

```
typedef std::shared_ptr<event_stream> vxg::cloud::agent::event_stream::ptr
```

**std::shared\_ptr** to `event_stream`

Definition at line 24 of file event-stream.h.

## 10.21.3 Constructor & Destructor Documentation

### 10.21.3.1 event\_stream()

```
vxg::cloud::agent::event_stream::event_stream (
    std::string name ) [inline]
```

Construct a new event stream object.

## Parameters

in	<i>name</i>	Event stream name, unique name for event stream
----	-------------	---

Definition at line 30 of file event-stream.h.

### 10.21.3.2 ~event\_stream()

```
virtual vxg::cloud::agent::event_stream::~~event_stream ( ) [inline], [virtual]
```

Definition at line 32 of file event-stream.h.

## 10.21.4 Member Function Documentation

### 10.21.4.1 finit()

```
virtual void vxg::cloud::agent::event_stream::finit ( ) [pure virtual]
```

### 10.21.4.2 get\_events()

```
virtual bool vxg::cloud::agent::event_stream::get_events (
    std::vector< proto::event_config > & configs ) [pure virtual]
```

Get the events configs list This method should update `config` object and add all configurations for the events provided by this event stream.

`config` may already include event configs reported by this `get_event()`, hence the implementation should consider this and do not include its event configs more than one time.

## Parameters

out	<i>configs</i>	Events configurations.
-----	----------------	------------------------

## Returns

`true` `configs` is valid.

`false` `configs` is invalid, should not be applied.

**Note**

This method **MUST** always return the configs with the same caps, otherwise the new config will not be applied by the library.

**10.21.4.3 init()**

```
virtual bool vxg::cloud::agent::event_stream::init ( ) [pure virtual]
```

**10.21.4.4 notify()**

```
bool vxg::cloud::agent::event_stream::notify (
    proto::event_object event ) [inline]
```

Callback should be called to notify event.

**Parameters**

in	<i>event</i>	Event object
----	--------------	--------------

**Returns**

true Event successfully notified  
false Notification failed

Definition at line 45 of file event-stream.h.

**10.21.4.5 set\_events()**

```
virtual bool vxg::cloud::agent::event_stream::set_events (
    const std::vector< proto::event_config > & config ) [pure virtual]
```

Set the events configuration.

**Parameters**

<i>config</i>	Events configurations list which includes all events reported by the system and other event streams, implementation should find own event configurations and apply them.
---------------	--

**Returns**

true config applied.  
false config not applied.



#### 10.21.4.6 set\_trigger\_recording()

```
virtual bool vxg::cloud::agent::event_stream::set_trigger_recording (
    bool enabled,
    int pre,
    int post ) [pure virtual]
```

Turn on/off the [event\\_stream](#) triggered recording and pre/post recording time.

Triggered recording means that event generated by this [event\\_stream](#) should start recording. Final recorded file should have duration of pre time + duration of the even + post time.

##### Note

Trigger driven recording can be used if platform supports such type of recording, implementation of such type of recording should include specific [agent::media::stream](#) records exporting mechanism which handles two consecutive events pre/post time intersections.

##### Parameters

in	<i>enabled</i>	true if event stream should trigger the recording. Implementation may ignore this if not trigger driven record method is used.
in	<i>pre</i>	Pre recording time in milliseconds.
in	<i>post</i>	Post recording time in milliseconds.

##### Returns

true  
false

#### 10.21.4.7 start()

```
virtual bool vxg::cloud::agent::event_stream::start ( ) [pure virtual]
```

Start events generation, called by internal code when the events generation requested by the VXG Cloud.

Event stream MUST immediately notify states of all stateful events after the [start\(\)](#) was invoked.

##### Returns

true Events generation started  
false Failed to start events generation

#### 10.21.4.8 stop()

```
virtual void vxg::cloud::agent::event_stream::stop ( ) [pure virtual]
```

Stop events generation.

#### 10.21.4.9 trigger\_event()

```
virtual bool vxg::cloud::agent::event_stream::trigger_event (
    proto::event_object & event ) [inline], [virtual]
```

Trigger event provided by [event\\_stream](#) If [get\\_events\(\)](#) returned event config with `proto::event_config.caps.trigger == true` and this event was triggered via the Cloud API this method will be called.

The logic of this method should be the same as for [vxg::cloud::agent::callback::on\\_trigger\\_event\(\)](#).

See also

[vxg::cloud::agent::callback::on\\_trigger\\_event\(\)](#)

Parameters

<i>event</i>	
--------------	--

Returns

true

false

Definition at line 102 of file event-stream.h.

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

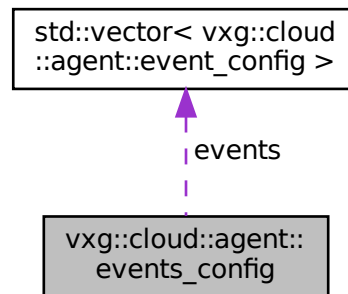
- [event-stream.h](#)

## 10.22 vxg::cloud::agent::events\_config Struct Reference

Events config, list of [event\\_config](#) objects.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::events\_config:



## Public Member Functions

- bool [get\\_event\\_config](#) (const event\_object &event, [event\\_config](#) &result)  
*Finds event which corresponds to [event\\_config](#) arg in the [events\\_config](#) structure.*

## Data Fields

- bool [enabled](#)  
*enabled: bool, indicates global events and event-driven streaming enabling flag*
- **std::vector**< [event\\_config](#) > [events](#)  
*events: list of [event\\_config](#) struct*

### 10.22.1 Detailed Description

Events config, list of [event\\_config](#) objects.

Definition at line 983 of file config.h.

### 10.22.2 Member Function Documentation

#### 10.22.2.1 get\_event\_config()

```
bool vxg::cloud::agent::events_config::get_event_config (
    const event_object & event,
    event\_config & result ) [inline]
```

Finds event which corresponds to [event\\_config](#) arg in the [events\\_config](#) structure.

**Parameters**

in	<i>event</i>	- event_object, event_object.event used to find the <a href="#">event_config</a>
out	<i>result</i>	- if <a href="#">event_config</a> found it will be stored here

**Returns**

true event found  
false event not found

Definition at line 1000 of file config.h.

## 10.22.3 Field Documentation

### 10.22.3.1 enabled

```
bool vxg::cloud::agent::events_config::enabled
```

enabled: bool, indicates global events and event-driven streaming enabling flag

Definition at line 986 of file config.h.

### 10.22.3.2 events

```
std::vector<event_config> vxg::cloud::agent::events_config::events
```

events: list of [event\\_config](#) struct

Definition at line 989 of file config.h.

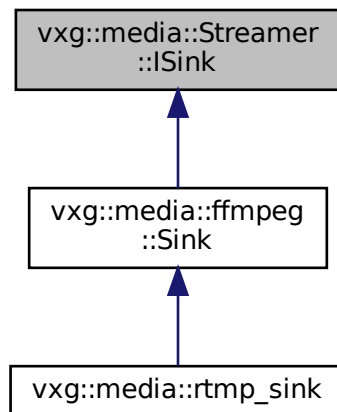
The documentation for this struct was generated from the following file:

- [config.h](#)

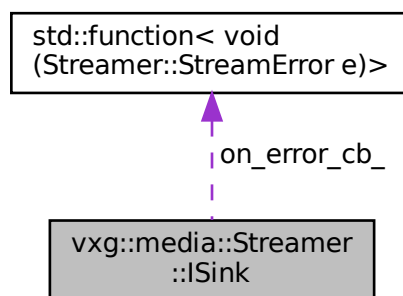
## 10.23 vxg::media::Streamer::ISink Class Reference

```
#include <streamer/base_streamer.h>
```

Inheritance diagram for vxg::media::Streamer::ISink:



Collaboration diagram for vxg::media::Streamer::ISink:



### Public Types

- typedef `std::shared_ptr< ISink > ptr`  
*std::shared\_ptr alias*
- typedef `std::unique_ptr< ISink > PtrU`  
*std::unique\_ptr alias*

## Public Member Functions

- [ISink](#) (uint8\_t prio=[SINK\\_THREAD\\_PRIO](#))  
*Construct a new [ISink](#) object.*
- virtual [~ISink](#) ()
- virtual bool [init](#) ( [std::string](#) url="")=0  
*Init sink.*
- virtual bool [finit](#) ()=0  
*Deinit sink.*
- virtual bool [process](#) ( [std::shared\\_ptr](#)< [MediaFrame](#) > frame)=0  
*Process next media frame.*
- virtual bool [droppable](#) ()=0  
*If sink of with dropping its media frames.*
- virtual bool [negotiate](#) ( [std::vector](#)< [Streamer::StreamInfo](#) > info)  
*Negotiation callback, this method called with collected from the [ISource::negotiate](#) media stream description.*
- virtual void [error](#) ([StreamError](#) error)  
*Media processing error callback, called when [ISink::process](#) returned false or linked source's [ISource::pullFrame](#) returned false, or when [ISource::error](#) was called.*
- virtual [std::string](#) [name](#) ()=0  
*Sink name.*
- virtual [cloud::duration](#) [duration](#) ()  
*Processed stream duration.*
- void [set\\_eos\\_cb](#) ( [std::function](#)< void([cloud::duration](#))> eos\_cb)
- void [set\\_eos](#) (bool eos)
- void [set\\_error\\_cb](#) (on\_error\_cb cb)

## Protected Attributes

- [on\\_error\\_cb](#) [on\\_error\\_cb\\_](#)

### 10.23.1 Detailed Description

Definition at line 507 of file `base_streamer.h`.

### 10.23.2 Member Typedef Documentation

#### 10.23.2.1 ptr

```
typedef std::shared\_ptr<ISink> vxg::media::Streamer::ISink::ptr
```

[std::shared\\_ptr](#) alias

Definition at line 512 of file `base_streamer.h`.

### 10.23.2.2 PtrU

```
typedef std::unique_ptr<ISink> vxg::media::Streamer::ISink::PtrU
```

**std::unique\_ptr** alias

Definition at line 514 of file base\_streamer.h.

## 10.23.3 Constructor & Destructor Documentation

### 10.23.3.1 ISink()

```
vxg::media::Streamer::ISink::ISink (
    uint8_t prio = SINK_THREAD_PRIO ) [inline]
```

Construct a new [ISink](#) object.

#### Parameters

<i>prio</i>	internall thread priority, used on RTOS.
-------------	--

Definition at line 519 of file base\_streamer.h.

### 10.23.3.2 ~ISink()

```
virtual vxg::media::Streamer::ISink::~ISink ( ) [inline], [virtual]
```

Definition at line 525 of file base\_streamer.h.

## 10.23.4 Member Function Documentation

### 10.23.4.1 droppable()

```
virtual bool vxg::media::Streamer::ISink::droppable ( ) [pure virtual]
```

If sink of with dropping its media frames.

#### Returns

- true Internal media thread allowed to drop frames if internal media queue is full.
- false No media frames dropping allowed.

Implemented in [vxg::media::rtmp\\_sink](#), and [vxg::media::ffmpeg::Sink](#).

#### 10.23.4.2 duration()

```
virtual cloud::duration vxg::media::Streamer::ISink::duration ( ) [inline], [virtual]
```

Processed stream duration.

##### Returns

duration

Reimplemented in [vxg::media::ffmpeg::Sink](#).

Definition at line 617 of file base\_streamer.h.

#### 10.23.4.3 error()

```
virtual void vxg::media::Streamer::ISink::error (
    StreamError error ) [inline], [virtual]
```

Media processing error callback, called when [ISink::process](#) returned false or linked source's [ISource::pullFrame](#) returned false, or when [ISource::error](#) was called.

Method may be overridden, default implementation calls on\_error\_cb that was provided by user with [set\\_error\\_cb\(\)](#).

##### Parameters

<i>error</i>	Error type.
--------------	-------------

Reimplemented in [vxg::media::ffmpeg::Sink](#).

Definition at line 574 of file base\_streamer.h.

#### 10.23.4.4 finit()

```
virtual bool vxg::media::Streamer::ISink::finit ( ) [pure virtual]
```

Deinit sink.

##### Returns

true finit success.  
false finit failed.

Implemented in [vxg::media::ffmpeg::Sink](#).



#### 10.23.4.5 init()

```
virtual bool vxg::media::Streamer::ISink::init (
    std::string url = "" ) [pure virtual]
```

Init sink.

**Parameters**

<i>in</i>	<i>url</i>	Url if needed.
-----------	------------	----------------

**Returns**

true init success.

false init failed.

Implemented in [vxd::media::ffmpeg::Sink](#), and [vxd::media::rtmp\\_sink](#).

**10.23.4.6 name()**

```
virtual std::string vxd::media::Streamer::ISink::name ( ) [pure virtual]
```

Sink name.

**Returns**

**std::string**

Implemented in [vxd::media::rtmp\\_sink](#), and [vxd::media::ffmpeg::Sink](#).

**10.23.4.7 negotiate()**

```
virtual bool vxd::media::Streamer::ISink::negotiate (
    std::vector< Streamer::StreamInfo > info ) [inline], [virtual]
```

Negotiation callback, this method called with collected from the [ISource::negotiate](#) media stream description.

**Parameters**

<i>info</i>	List of elementary streams descriptions.
-------------	--

**Returns**

true If streams descriptions accepted.

false Streams not accepted, will cause media thread stopping.

Reimplemented in [vxd::media::ffmpeg::Sink](#), and [vxd::media::rtmp\\_sink](#).

Definition at line 564 of file base\_streamer.h.

#### 10.23.4.8 process()

```
virtual bool vxg::media::Streamer::ISink::process (
    std::shared_ptr< MediaFrame > frame ) [pure virtual]
```

Process next media frame.

Internal function called by media thread, the last function of media frame travel. Final class process frame in this function: sends to server, writes on disk etc.

##### Parameters

in	<i>frame</i>	Media frame.
----	--------------	--------------

##### Returns

true Media frame successfully processed.

false Media frame processing failed.

#### 10.23.4.9 set\_eos()

```
void vxg::media::Streamer::ISink::set_eos (
    bool eos ) [inline]
```

Definition at line 680 of file base\_streamer.h.

#### 10.23.4.10 set\_eos\_cb()

```
void vxg::media::Streamer::ISink::set_eos_cb (
    std::function< void(cloud::duration)> eos_cb ) [inline]
```

Definition at line 676 of file base\_streamer.h.

#### 10.23.4.11 set\_error\_cb()

```
void vxg::media::Streamer::ISink::set_error_cb (
    on_error_cb cb ) [inline]
```

Definition at line 682 of file base\_streamer.h.

### 10.23.5 Field Documentation

### 10.23.5.1 on\_error\_cb\_

`on_error_cb` vxg::media::Streamer::ISink::on\_error\_cb\_ [protected]

Definition at line 685 of file base\_streamer.h.

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

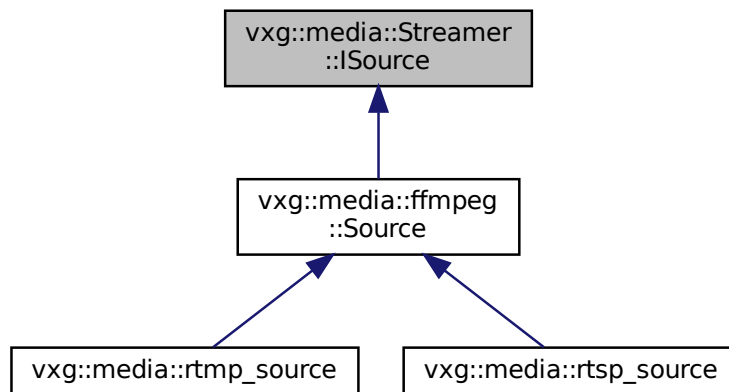
- [base\\_streamer.h](#)

## 10.24 vxg::media::Streamer::ISource Class Reference

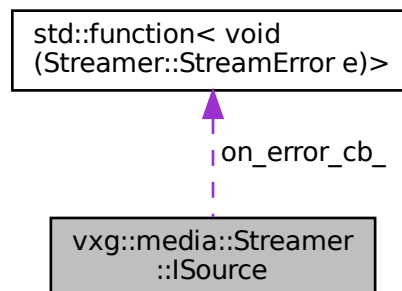
`ISource` interface class.

```
#include <streamer/base_streamer.h>
```

Inheritance diagram for vxg::media::Streamer::ISource:



Collaboration diagram for vxg::media::Streamer::ISource:



## Public Types

- enum [Mode](#) { [PULL](#), [PUSH](#) }  
*Source operation mode.*
- typedef [std::shared\\_ptr](#)< [ISource](#) > [ptr](#)

## Public Member Functions

- [ISource](#) (uint8\_t \_prio=[SRC\\_THREAD\\_PRIO](#), [Mode](#) \_mode=[PULL](#), bool drop=true)  
*Construct a new [ISource](#) object.*
- virtual bool [init](#) ( [std::string](#) url="" )=0  
*Init source.*
- virtual void [finit](#) ()=0  
*Finit souce.*
- virtual void [error](#) ([StreamError](#) stream\_error)  
*Error notification.*
- virtual [std::vector](#)< [Streamer::StreamInfo](#) > [negotiate](#) ()=0  
*Negotiation callback.*
- virtual [std::shared\\_ptr](#)< [MediaFrame](#) > [pullFrame](#) ()=0  
*Main method of the [Mode::PULL](#) mode data producing.*
- virtual [std::string](#) [name](#) ()=0  
*Source class name.*
- void [pushFrame](#) ( [std::shared\\_ptr](#)< [MediaFrame](#) > frame)  
*Implementation should call this method to provide media frames in the [Mode::PUSH](#) source operation mode.*
- void [set\\_error\\_cb](#) ([on\\_error\\_cb](#) cb)

## Protected Attributes

- [Mode](#) [mode\\_](#)
- [on\\_error\\_cb](#) [on\\_error\\_cb\\_](#)

### 10.24.1 Detailed Description

[ISource](#) interface class.

Definition at line 708 of file [base\\_streamer.h](#).

### 10.24.2 Member Typedef Documentation

#### 10.24.2.1 ptr

```
typedef std::shared\_ptr<ISource> vxg::media::Streamer::ISource::ptr
```

Definition at line 713 of file [base\\_streamer.h](#).

### 10.24.3 Member Enumeration Documentation

#### 10.24.3.1 Mode

enum `vsg::media::Streamer::ISource::Mode`

Source operation mode.

## Enumerator

PULL	Pull mode. The <a href="#">ISource::pullFrame()</a> will be called from the separate thread. User should implement it and return <code>std::shared_ptr&lt;MediaFrame&gt;</code> .
PUSH	Push mode. Inherited class should feed media data on its own by calling the <a href="#">ISource::pushFrame()</a> method with <a href="#">MediaFrame</a> object passed as argument.

Definition at line 715 of file `base_streamer.h`.

## 10.24.4 Constructor & Destructor Documentation

### 10.24.4.1 ISource()

```
vxg::media::Streamer::ISource::ISource (
    uint8_t _prio = SRC_THREAD_PRIO,
    Mode _mode = PULL,
    bool drop = true ) [inline]
```

Construct a new [ISource](#) object.

## Parameters

in	<code>_prio</code>	Push thread priority. Used if <code>_mode</code> is <code>Mode::PUSH</code> .
in	<code>_mode</code>	Source operating mode.
in	<code>drop</code>	If true the media frames may be dropped if queue is full.

Definition at line 731 of file `base_streamer.h`.

## 10.24.5 Member Function Documentation

### 10.24.5.1 error()

```
virtual void vxg::media::Streamer::ISource::error (
    StreamError stream_error ) [inline], [virtual]
```

Error notification.

Calling this method will inform media thread and all sinks about error happened in the source.

## Parameters

in	<code>stream_error</code>	
----	---------------------------	--

Definition at line 767 of file base\_streamer.h.

#### 10.24.5.2 finit()

```
virtual void vxg::media::Streamer::ISource::finit ( ) [pure virtual]
```

Finit souce.

Implemented in [vxg::media::ffmpeg::Source](#).

#### 10.24.5.3 init()

```
virtual bool vxg::media::Streamer::ISource::init (
    std::string url = "" ) [pure virtual]
```

Init source.

##### Parameters

<i>url</i>	Url if needed.
------------	----------------

##### Returns

true Init success.

false Init failed.

Implemented in [vxg::media::ffmpeg::Source](#), [vxg::media::rtsp\\_source](#), and [vxg::media::rtmp\\_source](#).

#### 10.24.5.4 name()

```
virtual std::string vxg::media::Streamer::ISource::name ( ) [pure virtual]
```

Source class name.

##### Returns

**std::string**

Implemented in [vxg::media::rtsp\\_source](#), and [vxg::media::ffmpeg::Source](#).



### 10.24.5.5 negotiate()

```
virtual std::vector<Streamer::StreamInfo> vxg::media::Streamer::ISource::negotiate ( ) [pure virtual]
```

Negotiation callback.

Called by internals. Class implementation should return the list of the streams info source will be producing for the sinks, this list will be then passed to the [ISink::negotiate](#) method.

#### Returns

std::vector<Streamer::StreamInfo>

Implemented in [vxg::media::ffmpeg::Source](#).

### 10.24.5.6 pullFrame()

```
virtual std::shared_ptr<MediaFrame> vxg::media::Streamer::ISource::pullFrame ( ) [pure virtual]
```

Main method of the Mode::PULL mode data producing.

Called by internals if the source operation mode is Mode::PULL. Implementation should return media frame object with correctly filled fields.

#### Returns

std::shared\_ptr<MediaFrame>

Implemented in [vxg::media::ffmpeg::Source](#).

### 10.24.5.7 pushFrame()

```
void vxg::media::Streamer::ISource::pushFrame (
    std::shared_ptr< MediaFrame > frame ) [inline]
```

Implementation should call this method to provide media frames in the Mode::PUSH source operation mode.

#### Parameters

<i>frame</i>	smart pointer to <a href="#">MediaFrame</a> .
--------------	---

Definition at line 870 of file base\_streamer.h.

### 10.24.5.8 set\_error\_cb()

```
void vxg::media::Streamer::ISource::set_error_cb (
    on_error_cb cb ) [inline]
```

Definition at line 971 of file base\_streamer.h.

## 10.24.6 Field Documentation

### 10.24.6.1 mode\_

```
Mode vxg::media::Streamer::ISource::mode_ [protected]
```

Definition at line 1009 of file base\_streamer.h.

### 10.24.6.2 on\_error\_cb\_

```
on_error_cb vxg::media::Streamer::ISource::on_error_cb_ [protected]
```

Definition at line 1010 of file base\_streamer.h.

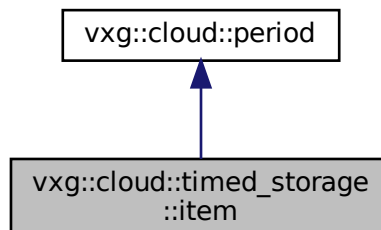
The documentation for this class was generated from the following file:

- [base\\_streamer.h](#)

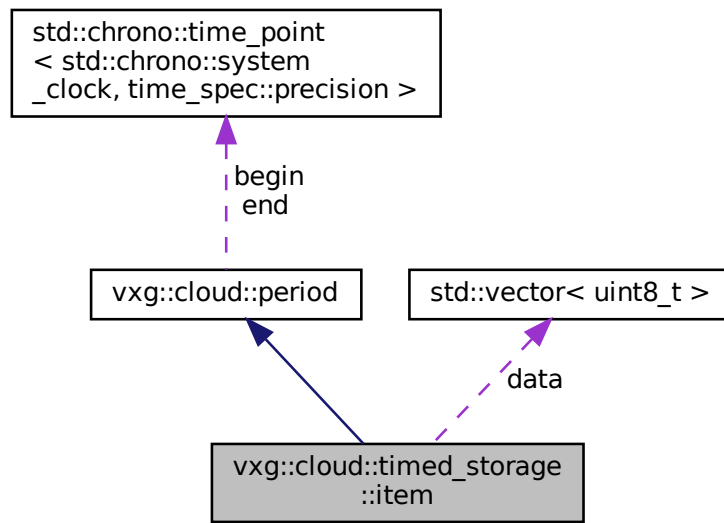
## 10.25 vxg::cloud::timed\_storage::item Struct Reference

```
#include <agent/timeline.h>
```

Inheritance diagram for vxg::cloud::timed\_storage::item:



Collaboration diagram for vxg::cloud::timed\_storage::item:



## Public Types

- enum `data_state` { `data_state::empty`, `data_state::loaded`, `data_state::async_ready` }

## Public Member Functions

- `item` (`cloud::time begin=utils::time::null()`, `cloud::time end=utils::time::null()`, `std::vector< uint8_t > data=std::vector< uint8_t >()`)
- `item` (`period p`, `std::vector< uint8_t > data=std::vector< uint8_t >()`)
- `item` (`std::vector< uint8_t > &&data`)
- void `clear` ()
- bool `empty` ()
- bool `operator<` (const `item` &r)

## Data Fields

- `std::vector< uint8_t > data`
- `data_state state`
- `agent::proto::command::upload_category category`
- `agent::proto::command::media_type media_type`

### 10.25.1 Detailed Description

Definition at line 72 of file timeline.h.

## 10.25.2 Member Enumeration Documentation

### 10.25.2.1 data\_state

```
enum vxg::cloud::timed_storage::item::data_state [strong]
```

#### Enumerator

empty	
loaded	
async_ready	

Definition at line 73 of file timeline.h.

## 10.25.3 Constructor & Destructor Documentation

### 10.25.3.1 item() [1/3]

```
vxg::cloud::timed_storage::item::item (
    cloud::time begin = utils::time::null(),
    cloud::time end = utils::time::null(),
    std::vector< uint8_t > data = std::vector<uint8_t>() ) [inline]
```

Definition at line 79 of file timeline.h.

### 10.25.3.2 item() [2/3]

```
vxg::cloud::timed_storage::item::item (
    period p,
    std::vector< uint8_t > data = std::vector<uint8_t>() ) [inline]
```

Definition at line 86 of file timeline.h.

### 10.25.3.3 item() [3/3]

```
vxg::cloud::timed_storage::item::item (
    std::vector< uint8_t > && data ) [inline]
```

Definition at line 91 of file timeline.h.

## 10.25.4 Member Function Documentation

### 10.25.4.1 clear()

```
void vxg::cloud::timed_storage::item::clear ( ) [inline]
```

Definition at line 95 of file timeline.h.

### 10.25.4.2 empty()

```
bool vxg::cloud::timed_storage::item::empty ( ) [inline]
```

Definition at line 101 of file timeline.h.

### 10.25.4.3 operator<()

```
bool vxg::cloud::timed_storage::item::operator< (
    const item & r ) [inline]
```

Definition at line 106 of file timeline.h.

## 10.25.5 Field Documentation

### 10.25.5.1 category

```
agent::proto::command::upload_category vxg::cloud::timed_storage::item::category
```

Definition at line 76 of file timeline.h.

### 10.25.5.2 data

```
std::vector<uint8_t> vxg::cloud::timed_storage::item::data
```

Definition at line 74 of file timeline.h.

### 10.25.5.3 media\_type

```
agent::proto::command::media_type vxg::cloud::timed_storage::item::media_type
```

Definition at line 77 of file timeline.h.

### 10.25.5.4 state

```
data_state vxg::cloud::timed_storage::item::state
```

Definition at line 75 of file timeline.h.

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

- [timeline.h](#)

## 10.26 vxg::logger Class Reference

Logger class, current implementation based on spdlog.

```
#include <utils/logging.h>
```

### Data Structures

- struct [options](#)

### Public Types

- enum [loglevel](#) {  
    [lvl\\_crit](#), [lvl\\_off](#), [lvl\\_error](#), [lvl\\_warn](#),  
    [lvl\\_info](#), [lvl\\_debug](#), [lvl\\_trace](#) }
- typedef [std::shared\\_ptr](#)< [spdlog::logger](#) > [logger\\_ptr](#)

## Static Public Member Functions

- static **std::shared\_ptr**< spdlog::logger > **instance** ( **std::string** name)  
*Get pointer to the instance of the named spdlog::logger object.*
- static void **reset** (int argc, char \*\*argv, **loglevel** l, **std::string** syslog\_ident="VXGCloudAgentDefault", **std::string** crash\_logfile\_path="", **std::string** logfile\_path="", size\_t logfile\_max\_size=(1024 \*1024), size\_t logfile\_max\_files=3)  
*Reset default logger parameters.*
- static void **reset** (const **options** &opts)
- static void **set\_level** (**logger\_ptr** log\_ptr, **loglevel** lvl)  
*Change the logger object loglevel.*
- template<typename FormatString , typename... Args>  
static void **info** (const FormatString &fmt, const Args &... args)  
*Static info log.*
- template<typename FormatString , typename... Args>  
static void **error** (const FormatString &fmt, const Args &... args)
- template<typename FormatString , typename... Args>  
static void **warn** (const FormatString &fmt, const Args &... args)
- template<typename FormatString , typename... Args>  
static void **debug** (const FormatString &fmt, const Args &... args)
- template<typename FormatString , typename... Args>  
static void **trace** (const FormatString &fmt, const Args &... args)
- template<typename T >  
static void **trace** (const T &msg)
- template<typename T >  
static void **debug** (const T &msg)
- template<typename T >  
static void **info** (const T &msg)
- template<typename T >  
static void **warn** (const T &msg)
- template<typename T >  
static void **error** (const T &msg)
- template<typename T >  
static void **critical** (const T &msg)

### 10.26.1 Detailed Description

Logger class, current implementation based on spdlog.

Definition at line 22 of file logging.h.

### 10.26.2 Member Typedef Documentation

#### 10.26.2.1 logger\_ptr

```
typedef std::shared_ptr<spdlog::logger> vxg::logger::logger_ptr
```

Definition at line 24 of file logging.h.

## 10.26.3 Member Enumeration Documentation

### 10.26.3.1 loglevel

```
enum vxg::logger::loglevel
```

#### Enumerator

lvl_crit	
lvl_off	
lvl_error	
lvl_warn	
lvl_info	
lvl_debug	
lvl_trace	

Definition at line 25 of file logging.h.

## 10.26.4 Member Function Documentation

### 10.26.4.1 critical()

```
template<typename T >  
static void vxg::logger::critical (  
    const T & msg ) [inline], [static]
```

Definition at line 315 of file logging.h.

### 10.26.4.2 debug() [1/2]

```
template<typename FormatString , typename... Args>  
static void vxg::logger::debug (  
    const FormatString & fmt,  
    const Args &... args ) [inline], [static]
```

Definition at line 282 of file logging.h.



### 10.26.4.3 debug() [2/2]

```
template<typename T >
static void vxg::logger::debug (
    const T & msg ) [inline], [static]
```

Definition at line 295 of file logging.h.

### 10.26.4.4 error() [1/2]

```
template<typename FormatString , typename... Args>
static void vxg::logger::error (
    const FormatString & fmt,
    const Args &... args ) [inline], [static]
```

Definition at line 274 of file logging.h.

### 10.26.4.5 error() [2/2]

```
template<typename T >
static void vxg::logger::error (
    const T & msg ) [inline], [static]
```

Definition at line 310 of file logging.h.

### 10.26.4.6 info() [1/2]

```
template<typename FormatString , typename... Args>
static void vxg::logger::info (
    const FormatString & fmt,
    const Args &... args ) [inline], [static]
```

Static info log.

#### Template Parameters

<i>FormatString</i>	
<i>Args</i>	

#### Parameters

<i>fmt</i>	
<i>args</i>	

Definition at line 270 of file logging.h.

#### 10.26.4.7 info() [2/2]

```
template<typename T >
static void vxg::logger::info (
    const T & msg ) [inline], [static]
```

Definition at line 300 of file logging.h.

#### 10.26.4.8 instance()

```
static std::shared_ptr<spdlog::logger> vxg::logger::instance (
    std::string name ) [inline], [static]
```

Get pointer to the instance of the named spdlog::logger object.

On the very first call creates default logger named 'default'. Constructs new logger if logger with such name was never requested

##### Parameters

in	name	Logger name. If logger with such name was already created, then it will be reused, otherwise a new one will be constructed.
----	------	---

##### Returns

std::shared\_ptr<spdlog::logger>

Definition at line 192 of file logging.h.

#### 10.26.4.9 reset() [1/2]

```
static void vxg::logger::reset (
    const options & opts ) [inline], [static]
```

Definition at line 239 of file logging.h.

#### 10.26.4.10 reset() [2/2]

```
static void vxg::logger::reset (
    int argc,
    char ** argv,
    loglevel l,
    std::string syslog_ident = "VXGCloudAgentDefault",
    std::string crash_logfile_path = "",
    std::string logfile_path = "",
    size_t logfile_max_size = (1024 * 1024),
    size_t logfile_max_files = 3 ) [inline], [static]
```

Reset default logger parameters.

Used to change all loggers parameters such as syslog/file sinks usage. Should be called before very first `logger::instance()` call to take effect. If wasn't called the default console logging sink only will be used for all loggers.

**Deprecated** Use `reset(const options& opts)`

##### Parameters

<i>argc</i>	Process argc
<i>argv</i>	Process argv
<i>l</i>	default loglevel, all loggers will be created with this loglevel, can be overridden with SPDLOG_LEVEL env variable
<i>syslog_ident</i>	Syslog identification string, if empty syslog logging will be disabled.
<i>logfile_path</i>	Rotating plain log file path, if empty no plain log file will be used.
<i>logfile_max_size</i>	Max log file size before invoking logrotate.
<i>logfile_max_files</i>	Max number if rotating logfiles.

Definition at line 220 of file logging.h.

#### 10.26.4.11 set\_level()

```
static void vxg::logger::set_level (
    logger_ptr log_ptr,
    loglevel lvl ) [inline], [static]
```

Change the logger object loglevel.

##### Parameters

<i>log_ptr</i>	Logger object pointer.
<i>lvl</i>	New loglevel.

Definition at line 259 of file logging.h.

**10.26.4.12 trace()** [1/2]

```
template<typename FormatString , typename... Args>
static void vxg::logger::trace (
    const FormatString & fmt,
    const Args &... args ) [inline], [static]
```

Definition at line 286 of file logging.h.

**10.26.4.13 trace()** [2/2]

```
template<typename T >
static void vxg::logger::trace (
    const T & msg ) [inline], [static]
```

Definition at line 290 of file logging.h.

**10.26.4.14 warn()** [1/2]

```
template<typename FormatString , typename... Args>
static void vxg::logger::warn (
    const FormatString & fmt,
    const Args &... args ) [inline], [static]
```

Definition at line 278 of file logging.h.

**10.26.4.15 warn()** [2/2]

```
template<typename T >
static void vxg::logger::warn (
    const T & msg ) [inline], [static]
```

Definition at line 305 of file logging.h.

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

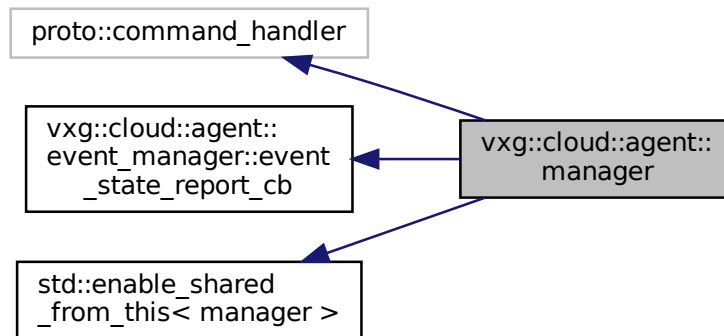
- [logging.h](#)

## 10.27 vxg::cloud::agent::manager Class Reference

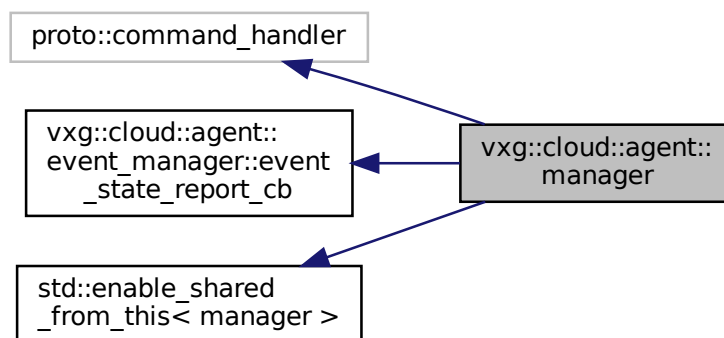
VXG Cloud agent manager class.

```
#include <agent/manager.h>
```

Inheritance diagram for vxg::cloud::agent::manager:



Collaboration diagram for vxg::cloud::agent::manager:



### Public Types

- using [direct\\_upload\\_payload\\_map](#) = **std::map**< proto::upload\_category, **std::shared\_ptr**< void > >
- using [direct\\_upload\\_payload\\_map\\_ptr](#) = **std::shared\_ptr**< [direct\\_upload\\_payload\\_map](#) >
- typedef **std::shared\_ptr**< [manager](#) > ptr  
*shared\_ptr to manager object*

## Public Member Functions

- bool [start](#) ()  
*Start internal workflow, this is the main function which starts all internal threads and connections.*
- void [stop](#) ()  
*Stop manager, disconnect from the VXG Cloud.*

## Static Public Member Functions

- static [manager::ptr create](#) (const [agent::config](#) &config, [callback::ptr callback](#), const [proto::access\\_token](#) &[access\\_token](#), [std::vector](#)< [agent::media::stream::ptr](#) > media\_streams, [std::vector](#)< [event\\_stream::ptr](#) > event\_streams= [std::vector](#)< [event\\_stream::ptr](#) >(0))  
*Create manager object.*

## Protected Member Functions

- bool [handle\\_event](#) ([proto::event\\_object](#) &event, bool need\_snapshot)
- bool [\\_update\\_storage\\_status](#) ()
- bool [handle\\_event\\_snapshot](#) ([proto::event\\_object](#) &event)
- bool [handle\\_event\\_meta\\_file](#) ([proto::event\\_object](#) &event)
- bool [\\_\\_notify\\_record\\_event](#) ( [std::string](#) stream\_id, bool on)
- virtual bool [on\\_get\\_stream\\_config](#) ([proto::stream\\_config](#) &config)
- virtual bool [on\\_set\\_stream\\_config](#) (const [proto::stream\\_config](#) &config)
- virtual bool [on\\_get\\_motion\\_detection\\_config](#) ([proto::motion\\_detection\\_config](#) &config)
- virtual bool [on\\_set\\_motion\\_detection\\_config](#) (const [proto::motion\\_detection\\_config](#) &config)
- virtual bool [on\\_get\\_cam\\_video\\_config](#) ([proto::video\\_config](#) &config)
- virtual bool [on\\_set\\_cam\\_video\\_config](#) (const [proto::video\\_config](#) &config)
- virtual bool [on\\_get\\_cam\\_events\\_config](#) ([proto::events\\_config](#) &config)
- virtual bool [on\\_set\\_cam\\_events\\_config](#) (const [proto::events\\_config](#) &config)
- virtual bool [on\\_get\\_cam\\_audio\\_config](#) ([proto::audio\\_config](#) &config)
- virtual bool [on\\_set\\_cam\\_audio\\_config](#) (const [proto::audio\\_config](#) &config)
- virtual bool [on\\_get\\_ptz\\_config](#) ([proto::ptz\\_config](#) &config)
- virtual bool [on\\_cam\\_ptz](#) ([proto::ptz\\_command](#) command)
- virtual bool [on\\_cam\\_ptz\\_preset](#) ([proto::ptz\\_preset](#) &preset\_op)
- virtual bool [on\\_get\\_osd\\_config](#) ([proto::osd\\_config](#) &config)
- virtual bool [on\\_set\\_osd\\_config](#) (const [proto::osd\\_config](#) &config)
- virtual bool [on\\_get\\_wifi\\_config](#) ([proto::wifi\\_config](#) &config)
- virtual bool [on\\_set\\_wifi\\_config](#) (const [proto::wifi\\_network](#) &config)
- virtual bool [on\\_stream\\_start](#) (const [std::string](#) &streamId, int publishSessionId, [proto::stream\\_reason](#) reason)
- virtual bool [on\\_stream\\_stop](#) (const [std::string](#) &streamId, [proto::stream\\_reason](#) reason)
- virtual bool [on\\_get\\_stream\\_caps](#) ([proto::stream\\_caps](#) &caps)
- virtual bool [on\\_get\\_supported\\_streams](#) ([proto::supported\\_streams\\_config](#) &supportedStreamsConfig)
- virtual bool [on\\_cam\\_upgrade\\_firmware](#) ( [std::string](#) url)
- virtual bool [on\\_raw\\_message](#) ( [std::string](#) client\_id, [std::string](#) &data)
- virtual bool [on\\_set\\_stream\\_by\\_event](#) ([proto::stream\\_by\\_event\\_config](#) conf)
- virtual bool [on\\_get\\_stream\\_by\\_event](#) ([proto::stream\\_by\\_event\\_config](#) &conf)
- virtual bool [on\\_update\\_preview](#) ( [std::string](#) url)
- virtual bool [on\\_direct\\_upload\\_url](#) (const [proto::command::direct\\_upload\\_url\\_base](#) &direct\_upload, int eventId, int ref\_id)
- virtual bool [on\\_get\\_log](#) ()
- virtual void [on\\_prepared](#) ()

- virtual void [on\\_closed](#) (int error, proto::command::bye\_reason reason)
- virtual bool [on\\_get\\_timezone](#) ( **std::string** &timezone)
- virtual bool [on\\_set\\_timezone](#) ( **std::string** timezone)
- void [on\\_set\\_periodic\\_events](#) (const char \*name, int [period](#), bool active)
- virtual bool [on\\_audio\\_file\\_play](#) ( **std::string** url)
- virtual bool [on\\_start\\_backward](#) ( **std::string** &url)
- virtual bool [on\\_stop\\_backward](#) ( **std::string** &url)
- virtual bool [on\\_get\\_cam\\_memorycard\\_timeline](#) (proto::command::cam\_memorycard\_timeline &[timeline](#))
- virtual bool [on\\_cam\\_memorycard\\_synchronize](#) (proto::command::cam\_memorycard\_synchronize\_status &synchronize\_status, vxg::cloud::time start, vxg::cloud::time end)
- virtual bool [on\\_cam\\_memorycard\\_synchronize\\_cancel](#) (const **std::string** &request\_id)
- virtual bool [on\\_cam\\_memorycard\\_recording](#) (const **std::string** &stream\_id, bool enabled)
- virtual bool [on\\_trigger\\_event](#) ( **std::string** event, json meta, cloud::time time)
- virtual bool [on\\_set\\_audio\\_detection](#) (const proto::audio\_detection\_config &conf)
- virtual bool [on\\_get\\_audio\\_detection](#) (proto::audio\_detection\_config &conf)
- virtual bool [on\\_set\\_log\\_enable](#) (bool bEnable)
- virtual bool [on\\_set\\_activity](#) (bool bEnable)
- virtual void [on\\_registered](#) (const **std::string** &sid)

### 10.27.1 Detailed Description

VXG Cloud agent manager class.

Definition at line 44 of file manager.h.

### 10.27.2 Member Typedef Documentation

#### 10.27.2.1 direct\_upload\_payload\_map

```
using vxg::cloud::agent::manager::direct_upload_payload_map = std::map<proto::upload_category,
std::shared_ptr<void> >
```

Definition at line 105 of file manager.h.

#### 10.27.2.2 direct\_upload\_payload\_map\_ptr

```
using vxg::cloud::agent::manager::direct_upload_payload_map_ptr = std::shared_ptr<direct_upload_payload_map>
```

Definition at line 107 of file manager.h.

### 10.27.2.3 ptr

```
typedef std::shared_ptr<manager> vxg::cloud::agent::manager::ptr
```

shared\_ptr to manager object

Definition at line 123 of file manager.h.

## 10.27.3 Member Function Documentation

### 10.27.3.1 \_\_notify\_record\_event()

```
bool vxg::cloud::agent::manager::__notify_record_event (
    std::string stream_id,
    bool on ) [protected]
```

### 10.27.3.2 \_update\_storage\_status()

```
bool vxg::cloud::agent::manager::_update_storage_status ( ) [protected]
```

### 10.27.3.3 create()

```
static manager::ptr vxg::cloud::agent::manager::create (
    const agent::config & config,
    callback::ptr callback,
    const proto::access_token & access_token,
    std::vector< agent::media::stream::ptr > media_streams,
    std::vector< event_stream::ptr > event_streams = std::vector< event_stream::ptr > (0)
) [static]
```

Create manager object.

#### Parameters

in	<i>config</i>	
in	<i>callback</i>	cm::callback object, should not be null
in	<i>access_token</i>	VXG Cloud access token
in	<i>media_streams</i>	List of <b>std::shared_ptr</b> to base_stream derived objects. Should have at least one element. base_stream is abstract class so you need to declare you own class derived from the base_stream or use one of the provided classes (rtsp_stream,...), basically each stream is for example one rtsp stream provided by the device. Each media stream device has should be represented as a separate base_stream derived object, currently only two streams per device are supported by the VXG Cloud.
in	<i>event_streams</i>	List of <i>event_stream::ptr</i> , can be empty. <i>event_stream</i> is abstract class so final implementation should use own class derived from the <i>event_stream</i> .
		Generated by Doxygen



## Returns

[manager::ptr](#)

### 10.27.3.4 handle\_event()

```
bool vxg::cloud::agent::manager::handle_event (
    proto::event_object & event,
    bool need_snapshot ) [protected]
```

### 10.27.3.5 handle\_event\_meta\_file()

```
bool vxg::cloud::agent::manager::handle_event_meta_file (
    proto::event_object & event ) [protected]
```

### 10.27.3.6 handle\_event\_snapshot()

```
bool vxg::cloud::agent::manager::handle_event_snapshot (
    proto::event_object & event ) [protected]
```

### 10.27.3.7 on\_audio\_file\_play()

```
virtual bool vxg::cloud::agent::manager::on_audio_file_play (
    std::string url ) [protected], [virtual]
```

### 10.27.3.8 on\_cam\_memorycard\_recording()

```
virtual bool vxg::cloud::agent::manager::on_cam_memorycard_recording (
    const std::string & stream_id,
    bool enabled ) [protected], [virtual]
```

### 10.27.3.9 on\_cam\_memorycard\_synchronize()

```
virtual bool vxg::cloud::agent::manager::on_cam_memorycard_synchronize (
    proto::command::cam_memorycard_synchronize_status & synchronize_status,
    vxg::cloud::time start,
    vxg::cloud::time end ) [protected], [virtual]
```

#### 10.27.3.10 on\_cam\_memorycard\_synchronize\_cancel()

```
virtual bool vxg::cloud::agent::manager::on_cam_memorycard_synchronize_cancel (
    const std::string & request_id ) [protected], [virtual]
```

#### 10.27.3.11 on\_cam\_ptz()

```
virtual bool vxg::cloud::agent::manager::on_cam_ptz (
    proto::ptz_command command ) [protected], [virtual]
```

#### 10.27.3.12 on\_cam\_ptz\_preset()

```
virtual bool vxg::cloud::agent::manager::on_cam_ptz_preset (
    proto::ptz_preset & preset_op ) [protected], [virtual]
```

#### 10.27.3.13 on\_cam\_upgrade\_firmware()

```
virtual bool vxg::cloud::agent::manager::on_cam_upgrade_firmware (
    std::string url ) [protected], [virtual]
```

#### 10.27.3.14 on\_closed()

```
virtual void vxg::cloud::agent::manager::on_closed (
    int error,
    proto::command::bye_reason reason ) [protected], [virtual]
```

#### 10.27.3.15 on\_direct\_upload\_url()

```
virtual bool vxg::cloud::agent::manager::on_direct_upload_url (
    const proto::command::direct_upload_url_base & direct_upload,
    int event_id,
    int ref_id ) [protected], [virtual]
```

#### 10.27.3.16 on\_get\_audio\_detection()

```
virtual bool vxg::cloud::agent::manager::on_get_audio_detection (
    proto::audio_detection_config & conf ) [protected], [virtual]
```

#### 10.27.3.17 on\_get\_cam\_audio\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_cam_audio_config (
    proto::audio_config & config ) [protected], [virtual]
```

#### 10.27.3.18 on\_get\_cam\_events\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_cam_events_config (
    proto::events_config & config ) [protected], [virtual]
```

#### 10.27.3.19 on\_get\_cam\_memorycard\_timeline()

```
virtual bool vxg::cloud::agent::manager::on_get_cam_memorycard_timeline (
    proto::command::cam_memorycard_timeline & timeline ) [protected], [virtual]
```

#### 10.27.3.20 on\_get\_cam\_video\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_cam_video_config (
    proto::video_config & config ) [protected], [virtual]
```

#### 10.27.3.21 on\_get\_log()

```
virtual bool vxg::cloud::agent::manager::on_get_log ( ) [protected], [virtual]
```

#### 10.27.3.22 on\_get\_motion\_detection\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_motion_detection_config (
    proto::motion_detection_config & config ) [protected], [virtual]
```

#### 10.27.3.23 on\_get\_osd\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_osd_config (
    proto::osd_config & config ) [protected], [virtual]
```

#### 10.27.3.24 on\_get\_ptz\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_ptz_config (
    proto::ptz_config & config ) [protected], [virtual]
```

#### 10.27.3.25 on\_get\_stream\_by\_event()

```
virtual bool vxg::cloud::agent::manager::on_get_stream_by_event (
    proto::stream_by_event_config & conf ) [protected], [virtual]
```

#### 10.27.3.26 on\_get\_stream\_caps()

```
virtual bool vxg::cloud::agent::manager::on_get_stream_caps (
    proto::stream_caps & caps ) [protected], [virtual]
```

#### 10.27.3.27 on\_get\_stream\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_stream_config (
    proto::stream_config & config ) [protected], [virtual]
```

#### 10.27.3.28 on\_get\_supported\_streams()

```
virtual bool vxg::cloud::agent::manager::on_get_supported_streams (
    proto::supported_streams_config & supportedStreamsConfig ) [protected], [virtual]
```

#### 10.27.3.29 on\_get\_timezone()

```
virtual bool vxg::cloud::agent::manager::on_get_timezone (
    std::string & timezone ) [protected], [virtual]
```

### 10.27.3.30 on\_get\_wifi\_config()

```
virtual bool vxg::cloud::agent::manager::on_get_wifi_config (
    proto::wifi_config & config ) [protected], [virtual]
```

### 10.27.3.31 on\_prepared()

```
virtual void vxg::cloud::agent::manager::on_prepared ( ) [protected], [virtual]
```

### 10.27.3.32 on\_raw\_message()

```
virtual bool vxg::cloud::agent::manager::on_raw_message (
    std::string client_id,
    std::string & data ) [protected], [virtual]
```

### 10.27.3.33 on\_registered()

```
virtual void vxg::cloud::agent::manager::on_registered (
    const std::string & sid ) [protected], [virtual]
```

### 10.27.3.34 on\_set\_activity()

```
virtual bool vxg::cloud::agent::manager::on_set_activity (
    bool bEnable ) [protected], [virtual]
```

### 10.27.3.35 on\_set\_audio\_detection()

```
virtual bool vxg::cloud::agent::manager::on_set_audio_detection (
    const proto::audio_detection_config & conf ) [protected], [virtual]
```

### 10.27.3.36 on\_set\_cam\_audio\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_cam_audio_config (
    const proto::audio_config & config ) [protected], [virtual]
```

#### 10.27.3.37 on\_set\_cam\_events\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_cam_events_config (
    const proto::events_config & config ) [protected], [virtual]
```

#### 10.27.3.38 on\_set\_cam\_video\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_cam_video_config (
    const proto::video_config & config ) [protected], [virtual]
```

#### 10.27.3.39 on\_set\_log\_enable()

```
virtual bool vxg::cloud::agent::manager::on_set_log_enable (
    bool bEnable ) [protected], [virtual]
```

#### 10.27.3.40 on\_set\_motion\_detection\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_motion_detection_config (
    const proto::motion_detection_config & config ) [protected], [virtual]
```

#### 10.27.3.41 on\_set\_osd\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_osd_config (
    const proto::osd_config & config ) [protected], [virtual]
```

#### 10.27.3.42 on\_set\_periodic\_events()

```
void vxg::cloud::agent::manager::on_set_periodic_events (
    const char * name,
    int period,
    bool active ) [protected]
```

#### 10.27.3.43 on\_set\_stream\_by\_event()

```
virtual bool vxg::cloud::agent::manager::on_set_stream_by_event (
    proto::stream_by_event_config conf ) [protected], [virtual]
```

#### 10.27.3.44 on\_set\_stream\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_stream_config (
    const proto::stream_config & config ) [protected], [virtual]
```

#### 10.27.3.45 on\_set\_timezone()

```
virtual bool vxg::cloud::agent::manager::on_set_timezone (
    std::string timezone ) [protected], [virtual]
```

#### 10.27.3.46 on\_set\_wifi\_config()

```
virtual bool vxg::cloud::agent::manager::on_set_wifi_config (
    const proto::wifi_network & config ) [protected], [virtual]
```

#### 10.27.3.47 on\_start\_backward()

```
virtual bool vxg::cloud::agent::manager::on_start_backward (
    std::string & url ) [protected], [virtual]
```

#### 10.27.3.48 on\_stop\_backward()

```
virtual bool vxg::cloud::agent::manager::on_stop_backward (
    std::string & url ) [protected], [virtual]
```

#### 10.27.3.49 on\_stream\_start()

```
virtual bool vxg::cloud::agent::manager::on_stream_start (
    const std::string & streamId,
    int publishSessionID,
    proto::stream_reason reason ) [protected], [virtual]
```

#### 10.27.3.50 on\_stream\_stop()

```
virtual bool vxg::cloud::agent::manager::on_stream_stop (
    const std::string & streamId,
    proto::stream_reason reason ) [protected], [virtual]
```

#### 10.27.3.51 on\_trigger\_event()

```
virtual bool vxg::cloud::agent::manager::on_trigger_event (
    std::string event,
    json meta,
    cloud::time time ) [protected], [virtual]
```

#### 10.27.3.52 on\_update\_preview()

```
virtual bool vxg::cloud::agent::manager::on_update_preview (
    std::string url ) [protected], [virtual]
```

#### 10.27.3.53 start()

```
bool vxg::cloud::agent::manager::start ( )
```

Start internal workflow, this is the main function which starts all internal threads and connections.

##### Returns

true started  
false start failed

#### 10.27.3.54 stop()

```
void vxg::cloud::agent::manager::stop ( )
```

Stop manager, disconnect from the VXG Cloud.

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

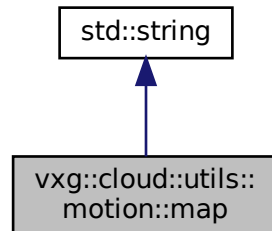
- [manager.h](#)



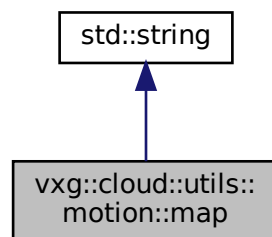
## 10.28 vxg::cloud::utils::motion::map Struct Reference

```
#include <utils/utils.h>
```

Inheritance diagram for vxg::cloud::utils::motion::map:



Collaboration diagram for vxg::cloud::utils::motion::map:



### Public Member Functions

- [map](#) ()
- [map](#) (const [map](#) &motionMap)
- [map](#) & [operator=](#) (const **std::string** &motionMap)

### Static Public Member Functions

- static **std::string** [pack](#) (const **std::string** &unpackedGrid)
- static **std::string** [unpack](#) (const **std::string** &packedMap, size\_t outputLen)

### 10.28.1 Detailed Description

Definition at line 124 of file utils.h.

## 10.28.2 Constructor & Destructor Documentation

### 10.28.2.1 map() [1/2]

```
vvg::cloud::utils::motion::map::map ( ) [inline], [explicit]
```

Definition at line 125 of file utils.h.

### 10.28.2.2 map() [2/2]

```
vvg::cloud::utils::motion::map::map (
    const map & motionMap ) [inline]
```

Definition at line 127 of file utils.h.

## 10.28.3 Member Function Documentation

### 10.28.3.1 operator=()

```
map& vvg::cloud::utils::motion::map::operator= (
    const std::string & motionMap ) [inline]
```

Definition at line 129 of file utils.h.

### 10.28.3.2 pack()

```
static std::string vvg::cloud::utils::motion::map::pack (
    const std::string & unpackedGrid ) [static]
```

### 10.28.3.3 unpack()

```
static std::string vvg::cloud::utils::motion::map::unpack (
    const std::string & packedMap,
    size_t outputLen ) [static]
```

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

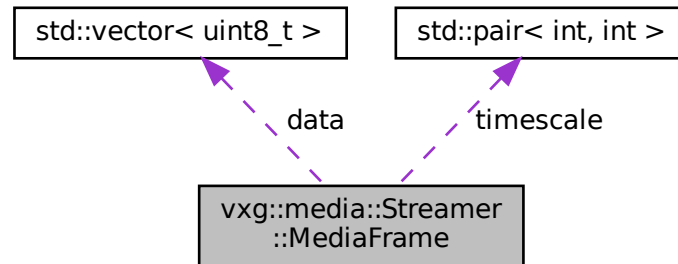
- [utils.h](#)

## 10.29 vxg::media::Streamer::MediaFrame Struct Reference

Media frame container.

```
#include <streamer/base_streamer.h>
```

Collaboration diagram for vxg::media::Streamer::MediaFrame:



### Public Member Functions

- bool [operator<](#) (const [MediaFrame](#) &rv)  
*Two frames comparison using timestamps.*

### Data Fields

- **std::vector< uint8\_t >** [data](#)  
*Media frame data.*
- **size\_t** [len](#)  
*Media frame data length.*
- **int64\_t** [pts](#)  
*Media frame timestamp in timescale that corresponds to timescale.*
- **int64\_t** [dts](#)  
*Media frame decoding timestamp in timescale that corresponds to timescale.*
- **int64\_t** [duration](#)  
*Media frame duration if needed.*
- bool [is\\_key](#)  
*Is key frame flag.*
- **MediaType** [type](#)  
*Media frame type.*
- **std::pair< int, int >** [timescale](#)  
*Timescale of pts and duration. ex. : 1/90000, 1/1000 etc.*
- **int64\_t** [time\\_realtime](#)  
*Real time if available from source, for ex.*

## Static Public Attributes

- static constexpr int64\_t [NOPTS](#)

### 10.29.1 Detailed Description

Media frame container.

Definition at line 418 of file base\_streamer.h.

### 10.29.2 Member Function Documentation

#### 10.29.2.1 operator<()

```
bool vxg::media::Streamer::MediaFrame::operator< (  
    const MediaFrame & rv ) [inline]
```

Two frames comparison using timestamps.

#### Parameters

<i>rv</i>	Right value
-----------	-------------

#### Returns

true

false

Definition at line 436 of file base\_streamer.h.

### 10.29.3 Field Documentation

#### 10.29.3.1 data

```
std::vector<uint8_t> vxg::media::Streamer::MediaFrame::data
```

Media frame data.

Definition at line 441 of file base\_streamer.h.

### 10.29.3.2 dts

```
int64_t vxg::media::Streamer::MediaFrame::dts
```

Media frame decoding timestamp in timescale that corresponds to timescale.

Definition at line 448 of file base\_streamer.h.

### 10.29.3.3 duration

```
int64_t vxg::media::Streamer::MediaFrame::duration
```

Media frame duration if needed.

Definition at line 450 of file base\_streamer.h.

### 10.29.3.4 is\_key

```
bool vxg::media::Streamer::MediaFrame::is_key
```

Is key frame flag.

Definition at line 452 of file base\_streamer.h.

### 10.29.3.5 len

```
size_t vxg::media::Streamer::MediaFrame::len
```

Media frame data length.

Definition at line 443 of file base\_streamer.h.

### 10.29.3.6 NOPTS

```
constexpr int64_t vxg::media::Streamer::MediaFrame::NOPTS [static], [constexpr]
```

Definition at line 438 of file base\_streamer.h.

### 10.29.3.7 pts

```
int64_t vxg::media::Streamer::MediaFrame::pts
```

Media frame timestamp in timescale that corresponds to timescale.

Definition at line 445 of file base\_streamer.h.

### 10.29.3.8 time\_realtime

```
int64_t vxg::media::Streamer::MediaFrame::time_realtime
```

Real time if available from source, for ex.

pts based on NTP time from RTCP SR

Definition at line 459 of file base\_streamer.h.

### 10.29.3.9 timescale

```
std::pair<int, int> vxg::media::Streamer::MediaFrame::timescale
```

Timescale of pts and duration. ex. : 1/90000, 1/1000 etc.

Definition at line 456 of file base\_streamer.h.

### 10.29.3.10 type

```
MediaType vxg::media::Streamer::MediaFrame::type
```

Media frame type.

Definition at line 454 of file base\_streamer.h.

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

- [base\\_streamer.h](#)

## 10.30 vxg::cloud::agent::proto::motion\_detection\_caps Struct Reference

Motion detection capabilities camera capabilities that limit possible motion detection configuration.

```
#include <agent-proto/objects/caps.h>
```

## Data Fields

- [size\\_t max\\_regions](#)  
*Mandatory: supported number of motion regions.*
- [motion\\_sensitivity sensitivity](#)  
*Mandatory: ("region", "frame"), default "region"; indicates if sensitivity can be set for region or for whole frame only.*
- [motion\\_region\\_shape region\\_shape](#)  
*Mandatory: ("rect", "any"), default "any"; specifies limitation of region shape.*

### 10.30.1 Detailed Description

Motion detection capabilities camera capabilities that limit possible motion detection configuration.

Definition at line 336 of file caps.h.

### 10.30.2 Field Documentation

#### 10.30.2.1 max\_regions

```
size_t vxg::cloud::agent::proto::motion_detection_caps::max_regions
```

Mandatory: supported number of motion regions.

Definition at line 339 of file caps.h.

#### 10.30.2.2 region\_shape

```
motion_region_shape vxg::cloud::agent::proto::motion_detection_caps::region_shape
```

Mandatory: ("rect", "any"), default "any"; specifies limitation of region shape.

Definition at line 348 of file caps.h.

#### 10.30.2.3 sensitivity

```
motion_sensitivity vxg::cloud::agent::proto::motion_detection_caps::sensitivity
```

Mandatory: ("region", "frame"), default "region"; indicates if sensitivity can be set for region or for whole frame only.

Definition at line 344 of file caps.h.

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

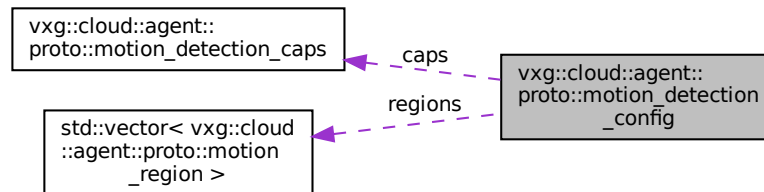
- [caps.h](#)

## 10.31 vxg::cloud::agent::proto::motion\_detection\_config Struct Reference

Motion detection config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::motion\_detection\_config:



### Data Fields

- int [columns](#)  
*Mandatory.*
- int [rows](#)  
*Mandatory.*
- [motion\\_detection\\_caps caps](#)  
*Mandatory for CM => SRV (reply to 'get\_motion\_detection') camera capabilities that limit possible motion detection configuration.*
- [std::vector< motion\\_region > regions](#)  
*Mandatory List of motion regions.*

### 10.31.1 Detailed Description

Motion detection config.

Definition at line 277 of file config.h.

### 10.31.2 Field Documentation

#### 10.31.2.1 caps

[motion\\_detection\\_caps](#) vxg::cloud::agent::proto::motion\_detection\_config::caps

Mandatory for CM => SRV (reply to 'get\_motion\_detection') camera capabilities that limit possible motion detection configuration.

Definition at line 286 of file config.h.



### 10.31.2.2 columns

```
int vxg::cloud::agent::proto::motion_detection_config::columns
```

Mandatory.

Definition at line 280 of file config.h.

### 10.31.2.3 regions

```
std::vector<motion_region> vxg::cloud::agent::proto::motion_detection_config::regions
```

Mandatory List of motion regions.

Definition at line 289 of file config.h.

### 10.31.2.4 rows

```
int vxg::cloud::agent::proto::motion_detection_config::rows
```

Mandatory.

Definition at line 283 of file config.h.

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

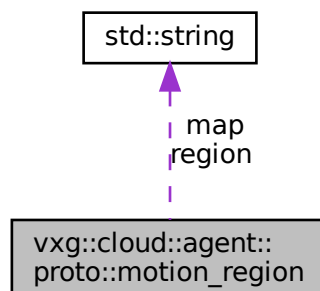
- [config.h](#)

## 10.32 vxg::cloud::agent::proto::motion\_region Struct Reference

Motion detection related structs.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::motion\_region:



## Data Fields

- **std::string** [region](#)  
*Mandatory: name of region if supported by camera.*
- **std::string** [map](#)  
*Mandatory: String is packed with Apple Packbit algorithm and after that encoded with Base64.*
- **size\_t** [sensitivity](#)  
*Mandatory: range 0-100; 0 - minimal sensitivity.*
- **bool** [enabled](#)  
*Mandatory: indicates that motion detection is enabled for the region.*

### 10.32.1 Detailed Description

Motion detection related structs.

Motion region

Definition at line 240 of file config.h.

### 10.32.2 Field Documentation

#### 10.32.2.1 [enabled](#)

```
bool vxg::cloud::agent::proto::motion_region::enabled
```

Mandatory: indicates that motion detection is enabled for the region.

Definition at line 262 of file config.h.

#### 10.32.2.2 [map](#)

```
std::string vxg::cloud::agent::proto::motion_region::map
```

Mandatory: String is packed with Apple Packbit algorithm and after that encoded with Base64.

Bitstring where “1” denotes an active cell and a “0” an inactive cell. The first cell is in the upper left corner. Then the cell order goes first from left to right and then from up to down. If the number of cells is not a multiple of 8 the last byte is padded with zeros.

Definition at line 252 of file config.h.

### 10.32.2.3 region

```
std::string vxg::cloud::agent::proto::motion_region::region
```

Mandatory: name of region if supported by camera.

Definition at line 243 of file config.h.

### 10.32.2.4 sensitivity

```
size_t vxg::cloud::agent::proto::motion_region::sensitivity
```

Mandatory: range 0-100; 0 - minimal sensitivity.

If sensitivity is supported only for whole frame, the same value should be used for all regions.

Definition at line 258 of file config.h.

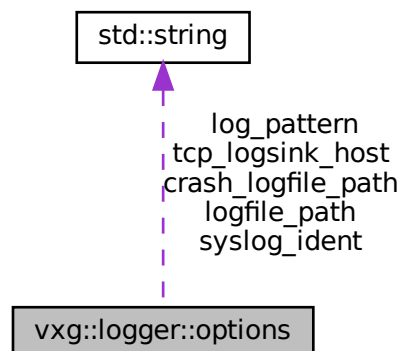
The documentation for this struct was generated from the following file:

- [config.h](#)

## 10.33 vxg::logger::options Struct Reference

```
#include <utils/logging.h>
```

Collaboration diagram for vxg::logger::options:



## Data Fields

- `std::string` `log_pattern`
- `std::string` `logfile_path`
- `size_t` `logfile_max_size`
- `size_t` `logfile_max_files`
- `std::string` `crash_logfile_path`
- `std::string` `syslog_ident`
- `loglevel` `default_loglevel`
- `bool` `tcp_logsink_enabled`
- `std::string` `tcp_logsink_host`
- `uint16_t` `tcp_logsink_port`

### 10.33.1 Detailed Description

Definition at line 35 of file `logging.h`.

### 10.33.2 Field Documentation

#### 10.33.2.1 `crash_logfile_path`

```
std::string vxg::logger::options::crash_logfile_path
```

Definition at line 41 of file `logging.h`.

#### 10.33.2.2 `default_loglevel`

```
loglevel vxg::logger::options::default_loglevel
```

Definition at line 43 of file `logging.h`.

#### 10.33.2.3 `log_pattern`

```
std::string vxg::logger::options::log_pattern
```

Definition at line 36 of file `logging.h`.

#### 10.33.2.4 logfile\_max\_files

size\_t vxg::logger::options::logfile\_max\_files

Definition at line 40 of file logging.h.

#### 10.33.2.5 logfile\_max\_size

size\_t vxg::logger::options::logfile\_max\_size

Definition at line 39 of file logging.h.

#### 10.33.2.6 logfile\_path

std::string vxg::logger::options::logfile\_path

Definition at line 38 of file logging.h.

#### 10.33.2.7 syslog\_ident

std::string vxg::logger::options::syslog\_ident

Definition at line 42 of file logging.h.

#### 10.33.2.8 tcp\_logsink\_enabled

bool vxg::logger::options::tcp\_logsink\_enabled

Definition at line 44 of file logging.h.

#### 10.33.2.9 tcp\_logsink\_host

std::string vxg::logger::options::tcp\_logsink\_host

Definition at line 45 of file logging.h.

### 10.33.2.10 tcp\_logsink\_port

uint16\_t vxg::logger::options::tcp\_logsink\_port

Definition at line 46 of file logging.h.

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

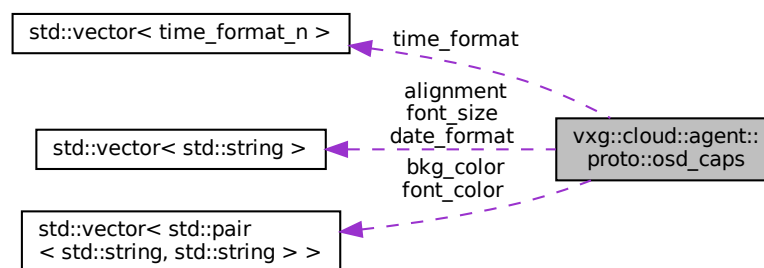
- [logging.h](#)

## 10.34 vxg::cloud::agent::proto::osd\_caps Struct Reference

OSD capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::osd\_caps:



### Data Fields

- bool [system\\_id](#)  
*system\_id*: bool, True when OSD supports separate system\_id enabling/disabling
- bool [system\\_id\\_text](#)  
*system\_id\_text*: bool, True when OSD supports separate system\_id customization
- bool [time](#)  
*time*: bool, True when OSD supports separate time enabling/disabling
- **std::vector**< [time\\_format\\_n](#) > [time\\_format](#)  
*time\_format*: list of string, supported time formats.
- bool [date](#)  
*date*: bool, True when OSD supports separate date enabling/disabling
- **std::vector**< **std::string** > [date\\_format](#)  
*date\_format*: list of string, supported date formats.
- **std::vector**< **std::string** > [font\\_size](#)  
*font\_size*: list of string, describes supported font sizes.
- **std::vector**< **std::pair**< **std::string**, **std::string** > > [font\\_color](#)  
*font\_color*: list of pairs [string (name), optional string (value)], predefined set of possible font colors.
- **std::vector**< **std::pair**< **std::string**, **std::string** > > [bkg\\_color](#)  
*bkg\_color*: list of pairs [string (name), optional string (value)], predefined set of possible background colors.
- bool [bkg\\_transp](#)  
*bkg\_transp*: bool, True when OSD supports background transparency
- **std::vector**< **std::string** > [alignment](#)  
*alignment*: list of strings, supported OSD positions.

### 10.34.1 Detailed Description

OSD capabilities.

Definition at line 621 of file caps.h.

### 10.34.2 Field Documentation

#### 10.34.2.1 alignment

```
std::vector< std::string> vxg::cloud::agent::proto::osd_caps::alignment
```

alignment: list of strings, supported OSD positions.

Empty list means – position can't be changed. Example: ["UpperLeft", "UpperRight", "LowerLeft", "LowerRight"]

Definition at line 660 of file caps.h.

#### 10.34.2.2 bkg\_color

```
std::vector< std::pair< std::string, std::string> > vxg::cloud::agent::proto::osd_caps↵↵::bkg_color
```

bkg\_color: list of pairs [string (name), optional string (value)], predefined set of possible background colors.

Empty list means – color selection is not supported. Optioanal value is a RGB color code in HEX. Example: [{"↵↵Black", "000000"}]

Definition at line 654 of file caps.h.

#### 10.34.2.3 bkg\_transp

```
bool vxg::cloud::agent::proto::osd_caps::bkg_transp
```

bkg\_transp: bool, True when OSD supports background transparency

Definition at line 656 of file caps.h.

#### 10.34.2.4 date

```
bool vxg::cloud::agent::proto::osd_caps::date
```

date: bool, True when OSD supports separate date enabling/disabling

Definition at line 635 of file caps.h.

#### 10.34.2.5 date\_format

```
std::vector< std::string> vxg::cloud::agent::proto::osd_caps::date_format
```

date\_format: list of string, supported date formats.

Empty list means – date format selection is not supported. Example: ["YYYY-MM-DD", "MM-DD-YYYY", "DD-MM-YYYY", "YYYY/MM/DD", "MM/DD/YYYY2", "DD/MM/YYYY"]

Definition at line 639 of file caps.h.

#### 10.34.2.6 font\_color

```
std::vector< std::pair< std::string, std::string> > vxg::cloud::agent::proto::osd_caps←  
::font_color
```

font\_color: list of pairs [string (name), optional string (value)], predefined set of possible font colors.

Empty list means – color selection is not supported. Optioanal value is a RGB color code in HEX. Example: [{"↵  
Orange", "FF9C00"}]

Definition at line 648 of file caps.h.

#### 10.34.2.7 font\_size

```
std::vector< std::string> vxg::cloud::agent::proto::osd_caps::font_size
```

font\_size: list of string, describes supported font sizes.

Empty list means – font size format selection is not supported. Examples: ["16", "32", "48", "64", "auto"] or ["Small", "Normal", "Big"]

Definition at line 643 of file caps.h.



### 10.34.2.8 system\_id

```
bool vxg::cloud::agent::proto::osd_caps::system_id
```

system\_id: bool, True when OSD supports separate system\_id enabling/disabling

Definition at line 624 of file caps.h.

### 10.34.2.9 system\_id\_text

```
bool vxg::cloud::agent::proto::osd_caps::system_id_text
```

system\_id\_text: bool, True when OSD supports separate system\_id customization

Definition at line 627 of file caps.h.

### 10.34.2.10 time

```
bool vxg::cloud::agent::proto::osd_caps::time
```

time: bool, True when OSD supports separate time enabling/disabling

Definition at line 629 of file caps.h.

### 10.34.2.11 time\_format

```
std::vector<time_format_n> vxg::cloud::agent::proto::osd_caps::time_format
```

time\_format: list of string, supported time formats.

Empty list means – time format selection is not supported. Example: ["12h", "24h"]

Definition at line 633 of file caps.h.

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

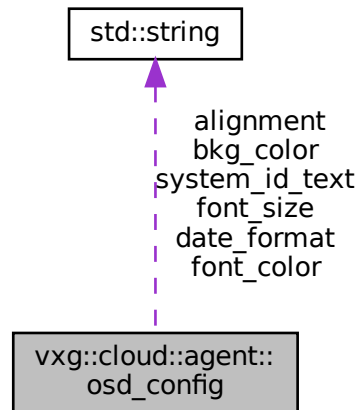
- [caps.h](#)

## 10.35 vxg::cloud::agent::osd\_config Struct Reference

OSD config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::osd\_config:



### Data Fields

- bool [system\\_id](#)  
*system\_id: optional bool, enable/disable static part of OSD*
- **std::string** [system\\_id\\_text](#)  
*system\_id\_text: optional string, a static content of OSD*
- bool [time](#)  
*time: optional bool, enable/disable time part of OSD*
- time\_format\_n [time\\_format](#)  
*time\_format: optional string, one of predefined values from the time\_format\_n, should be included in caps.*
- bool [date](#)  
*date: optional bool, enable/disable date part of OSD*
- **std::string** [date\\_format](#)  
*date\_format: optional string, one of predefined values from caps*
- **std::string** [font\\_size](#)  
*font\_size: optional string, one of predefined font sizes from caps*
- **std::string** [font\\_color](#)  
*font\_color: optional string, name of one of predefined font colors from caps*
- **std::string** [bkg\\_color](#)  
*bkg\_color: optional string, name of one of predefined background colors from caps*
- bool [bkg\\_transp](#)  
*bkg\_transp: optional bool, enable/disable OSD background transparency*
- **std::string** [alignment](#)  
*alignment: optional string, one of predefined positions from caps*
- osd\_caps [caps](#)  
*OSD capabilities of the device.*

### 10.35.1 Detailed Description

OSD config.

On Screen Display configuration object.

Definition at line 1134 of file config.h.

### 10.35.2 Field Documentation

#### 10.35.2.1 alignment

```
std::string vxg::cloud::agent::osd_config::alignment
```

alignment: optional string, one of predefined positions from caps

Definition at line 1165 of file config.h.

#### 10.35.2.2 bkg\_color

```
std::string vxg::cloud::agent::osd_config::bkg_color
```

bkg\_color: optional string, name of one of predefined background colors from caps

Definition at line 1161 of file config.h.

#### 10.35.2.3 bkg\_transp

```
bool vxg::cloud::agent::osd_config::bkg_transp
```

bkg\_transp: optional bool, enable/disable OSD background transparency

Definition at line 1163 of file config.h.

#### 10.35.2.4 caps

```
osd_caps vxg::cloud::agent::osd_config::caps
```

OSD capabilities of the device.

Definition at line 1168 of file config.h.

#### 10.35.2.5 date

```
bool vxg::cloud::agent::osd_config::date
```

date: optional bool, enable/disable date part of OSD

Definition at line 1149 of file config.h.

#### 10.35.2.6 date\_format

```
std::string vxg::cloud::agent::osd_config::date_format
```

date\_format: optional string, one of predefined values from caps

Definition at line 1152 of file config.h.

#### 10.35.2.7 font\_color

```
std::string vxg::cloud::agent::osd_config::font_color
```

font\_color: optional string, name of one of predefined font colors from caps

Definition at line 1158 of file config.h.

#### 10.35.2.8 font\_size

```
std::string vxg::cloud::agent::osd_config::font_size
```

font\_size: optional string, one of predefined font sizes from caps

Definition at line 1155 of file config.h.

#### 10.35.2.9 system\_id

```
bool vxg::cloud::agent::osd_config::system_id
```

system\_id: optional bool, enable/disable static part of OSD

Definition at line 1137 of file config.h.

### 10.35.2.10 system\_id\_text

```
std::string vxg::cloud::agent::osd_config::system_id_text
```

system\_id\_text: optional string, a static content of OSD

Definition at line 1140 of file config.h.

### 10.35.2.11 time

```
bool vxg::cloud::agent::osd_config::time
```

time: optional bool, enable/disable time part of OSD

Definition at line 1143 of file config.h.

### 10.35.2.12 time\_format

```
time_format_n vxg::cloud::agent::osd_config::time_format
```

time\_format: optional string, one of predefined values from the time\_format\_n, should be included in caps.

Definition at line 1146 of file config.h.

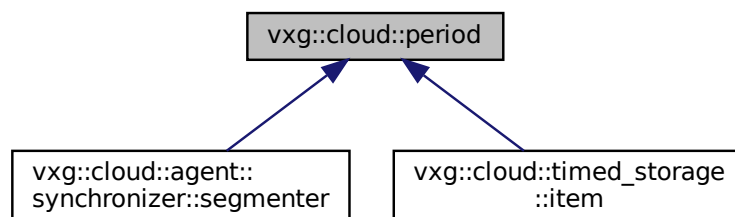
The documentation for this struct was generated from the following file:

- [config.h](#)

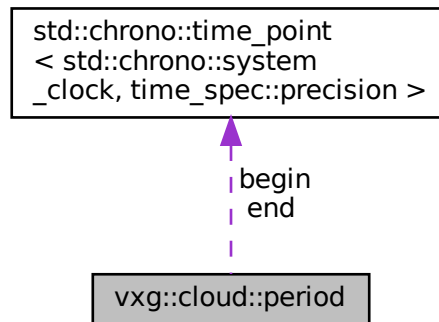
## 10.36 vxg::cloud::period Struct Reference

```
#include <agent/timeline.h>
```

Inheritance diagram for vxg::cloud::period:



Collaboration diagram for vxg::cloud::period:



## Public Member Functions

- [period](#) ([cloud::time \\_begin=utils::time::null\(\)](#), [cloud::time \\_end=utils::time::null\(\)](#))
- [period](#) ([agent::proto::command::get\\_direct\\_upload\\_url l](#))
- bool [is\\_open](#) ()
- bool [is\\_null](#) ()
- bool [is\\_valid](#) ()
- bool [intersects](#) (const [period](#) &r)
- void [clear](#) ()
- [cloud::time::duration duration](#) ()
- bool [operator<](#) (const [period](#) &r)

## Data Fields

- [cloud::time begin](#)
- [cloud::time end](#)

### 10.36.1 Detailed Description

Definition at line 23 of file timeline.h.

### 10.36.2 Constructor & Destructor Documentation

### 10.36.2.1 period() [1/2]

```
vxg::cloud::period::period (
    cloud::time _begin = utils::time::null(),
    cloud::time _end = utils::time::null() ) [inline]
```

Definition at line 27 of file timeline.h.

### 10.36.2.2 period() [2/2]

```
vxg::cloud::period::period (
    agent::proto::command::get_direct_upload_url l ) [inline]
```

Definition at line 32 of file timeline.h.

## 10.36.3 Member Function Documentation

### 10.36.3.1 clear()

```
void vxg::cloud::period::clear ( ) [inline]
```

Definition at line 57 of file timeline.h.

### 10.36.3.2 duration()

```
cloud::time::duration vxg::cloud::period::duration ( ) [inline]
```

Definition at line 62 of file timeline.h.

### 10.36.3.3 intersects()

```
bool vxg::cloud::period::intersects (
    const period & r ) [inline]
```

Definition at line 46 of file timeline.h.

#### 10.36.3.4 is\_null()

```
bool vxg::cloud::period::is_null ( ) [inline]
```

Definition at line 40 of file timeline.h.

#### 10.36.3.5 is\_open()

```
bool vxg::cloud::period::is_open ( ) [inline]
```

Definition at line 39 of file timeline.h.

#### 10.36.3.6 is\_valid()

```
bool vxg::cloud::period::is_valid ( ) [inline]
```

Definition at line 41 of file timeline.h.

#### 10.36.3.7 operator<()

```
bool vxg::cloud::period::operator< (
    const period & r ) [inline]
```

Definition at line 64 of file timeline.h.

### 10.36.4 Field Documentation

#### 10.36.4.1 begin

```
cloud::time vxg::cloud::period::begin
```

Definition at line 24 of file timeline.h.



### 10.36.4.2 end

`cloud::time vxg::cloud::period::end`

Definition at line 25 of file timeline.h.

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

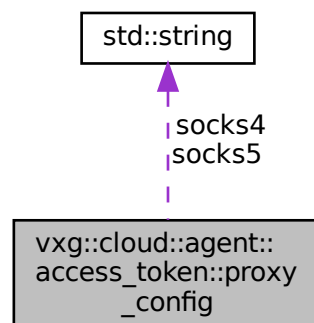
- [timeline.h](#)

## 10.37 vxg::cloud::agent::access\_token::proxy\_config Struct Reference

Socks proxy settings.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::access\_token::proxy\_config:



### Data Fields

- `std::string socks4`  
*SOCKS4 proxy uri.*
- `std::string socks5`  
*SOCKS5 proxy uri, ex. socks5://user:pwd@host:port.*

### 10.37.1 Detailed Description

Socks proxy settings.

Definition at line 1194 of file config.h.

## 10.37.2 Field Documentation

### 10.37.2.1 socks4

`std::string vxg::cloud::agent::access_token::proxy_config::socks4`

SOCKS4 proxy uri.

Definition at line 1196 of file config.h.

### 10.37.2.2 socks5

`std::string vxg::cloud::agent::access_token::proxy_config::socks5`

SOCKS5 proxy uri, ex. socks5://user:pwd@host:port.

Definition at line 1198 of file config.h.

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

- [config.h](#)

## 10.38 vxg::cloud::agent::ptz\_command Struct Reference

PTZ command.

```
#include <agent-proto/objects/config.h>
```

### Data Fields

- ptz\_action [action](#)  
*action: string, Camera informs server about list of supported actions with 3.30 cam\_ptz\_conf (CM) command*
- int [tm](#)  
*tm: optional int, operation time that allows to make PTZ with specified steps, msec*

### 10.38.1 Detailed Description

PTZ command.

Definition at line 1112 of file config.h.

## 10.38.2 Field Documentation

### 10.38.2.1 action

```
ptz_action vxg::cloud::agent::ptz_command::action
```

action: string, Camera informs server about list of supported actions with 3.30 cam\_ptz\_conf (CM) command

Definition at line 1116 of file config.h.

### 10.38.2.2 tm

```
int vxg::cloud::agent::ptz_command::tm
```

tm: optional int, operation time that allows to make PTZ with specified steps, msec

Definition at line 1120 of file config.h.

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

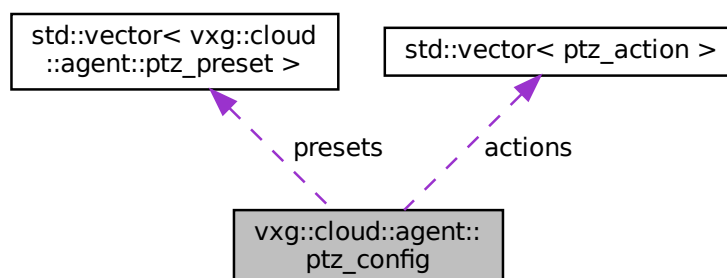
- [config.h](#)

## 10.39 vxg::cloud::agent::ptz\_config Struct Reference

PTZ config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::ptz\_config:



## Data Fields

- **std::vector**< ptz\_action > [actions](#)  
*actions: list of strings, list of supported PTZ actions.*
- int [maximum\\_number\\_of\\_presets](#)  
*maximum\_number\_of\_presets: optional int, max number of supported presets when camera supports.*
- **std::vector**< [ptz\\_preset](#) > [presets](#)  
*presets: optional list of structures [ptz\\_preset](#)*

### 10.39.1 Detailed Description

PTZ config.

Definition at line 1087 of file config.h.

### 10.39.2 Field Documentation

#### 10.39.2.1 actions

```
std::vector<ptz_action> vxg::cloud::agent::ptz_config::actions
```

actions: list of strings, list of supported PTZ actions.

Possible values: "left", "right", "top", "bottom", "zoom\_in", "zoom\_out", "stop". Server sends commands via 3.5 cam\_ptz (SRV)

Definition at line 1091 of file config.h.

#### 10.39.2.2 maximum\_number\_of\_presets

```
int vxg::cloud::agent::ptz_config::maximum_number_of_presets
```

maximum\_number\_of\_presets: optional int, max number of supported presets when camera supports.

Zero value, the missed parameter or missed or empty presets list are interpreted by server as "camera doesn't support PTZ"

Definition at line 1097 of file config.h.

### 10.39.2.3 presets

```
std::vector<ptz_preset> vxg::cloud::agent::ptz_config::presets
```

presets: optional list of structures [ptz\\_preset](#)

Definition at line 1100 of file config.h.

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

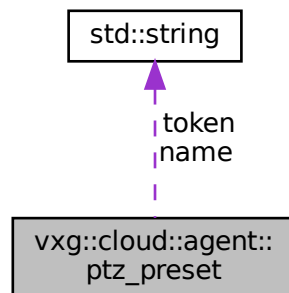
- [config.h](#)

## 10.40 vxg::cloud::agent::ptz\_preset Struct Reference

PTZ preset.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::ptz\_preset:



### Data Fields

- **std::string** [token](#)  
*token: string, an unique token of preset what is used for all operations with preset*
- **std::string** [name](#)  
*name: string, user friendly name of preset*
- **ptz\_preset\_action** [action](#)  
*actions: list of strings, required preset action.*

### 10.40.1 Detailed Description

PTZ preset.

Definition at line 1069 of file config.h.

## 10.40.2 Field Documentation

### 10.40.2.1 action

```
ptz_preset_action vxg::cloud::agent::ptz_preset::action
```

actions: list of strings, required preset action.

Possible values: "create", "delete", "goto", "update"

Definition at line 1078 of file config.h.

### 10.40.2.2 name

```
std::string vxg::cloud::agent::ptz_preset::name
```

name: string, user friendly name of preset

Definition at line 1074 of file config.h.

### 10.40.2.3 token

```
std::string vxg::cloud::agent::ptz_preset::token
```

token: string, an unique token of preset what is used for all operations with preset

Definition at line 1072 of file config.h.

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

- [config.h](#)

## 10.41 vxg::cloud::utils::queued\_async\_handler< T > Class Template Reference

```
#include <utils/queued-handler.h>
```

### Public Types

- using [handler\\_func](#) = `std::function< void(const T &o)>`

## Public Member Functions

- [queued\\_async\\_handler](#) ([handler\\_func](#) cb=nullptr)
- [~queued\\_async\\_handler](#) ()
- void [start](#) ()
- void [stop](#) ()
- void [push](#) (T o)
- [handler\\_func](#) [get\\_handler](#) ()
- void [set\\_handler](#) ([handler\\_func](#) h)

### 10.41.1 Detailed Description

```
template<class T>
class vxg::cloud::utils::queued_async_handler< T >
```

Definition at line 11 of file queued-handler.h.

### 10.41.2 Member Typedef Documentation

#### 10.41.2.1 handler\_func

```
template<class T >
using vxg::cloud::utils::queued_async_handler< T >::handler_func = std::function<void(const
T& o)>
```

Definition at line 13 of file queued-handler.h.

### 10.41.3 Constructor & Destructor Documentation

#### 10.41.3.1 queued\_async\_handler()

```
template<class T >
vxg::cloud::utils::queued_async_handler< T >::queued_async_handler (
    handler_func cb = nullptr ) [inline]
```

Definition at line 23 of file queued-handler.h.

#### 10.41.3.2 ~queued\_async\_handler()

```
template<class T >
vxg::cloud::utils::queued_async_handler< T >::~~queued_async_handler ( ) [inline]
```

Definition at line 24 of file queued-handler.h.

## 10.41.4 Member Function Documentation

### 10.41.4.1 `get_handler()`

```
template<class T >
handler_func vxg::cloud::utils::queued_async_handler< T >::get_handler ( ) [inline]
```

Definition at line 54 of file `queued-handler.h`.

### 10.41.4.2 `push()`

```
template<class T >
void vxg::cloud::utils::queued_async_handler< T >::push (
    T o ) [inline]
```

Definition at line 48 of file `queued-handler.h`.

### 10.41.4.3 `set_handler()`

```
template<class T >
void vxg::cloud::utils::queued_async_handler< T >::set_handler (
    handler_func h ) [inline]
```

Definition at line 55 of file `queued-handler.h`.

### 10.41.4.4 `start()`

```
template<class T >
void vxg::cloud::utils::queued_async_handler< T >::start ( ) [inline]
```

Definition at line 26 of file `queued-handler.h`.

### 10.41.4.5 `stop()`

```
template<class T >
void vxg::cloud::utils::queued_async_handler< T >::stop ( ) [inline]
```

Definition at line 39 of file `queued-handler.h`.

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

- [queued-handler.h](#)

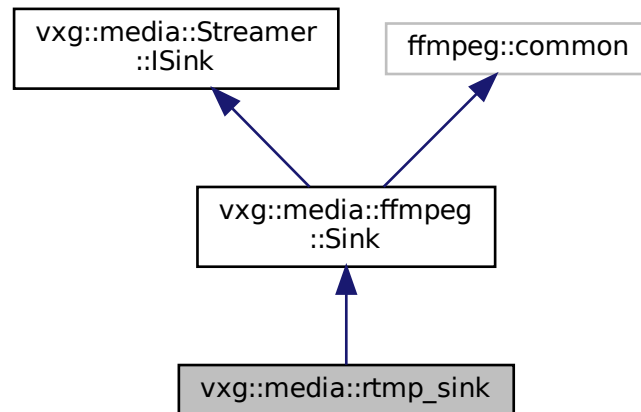


## 10.42 vxg::media::rtmp\_sink Class Reference

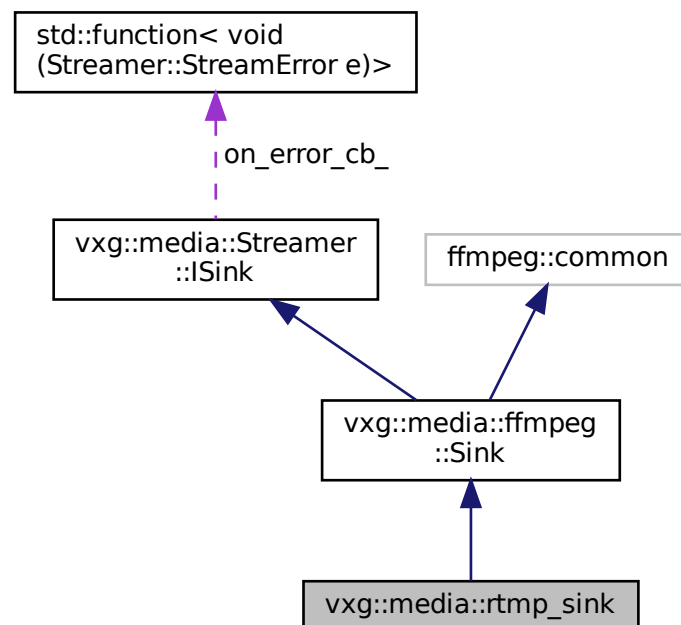
RTMP sink class.

```
#include <streamer/rtmp_sink.h>
```

Inheritance diagram for vxg::media::rtmp\_sink:



Collaboration diagram for vxg::media::rtmp\_sink:



## Public Member Functions

- [rtmp\\_sink](#) ()  
*Construct a new rtmp sink object.*
- virtual bool [init](#) ( **std::string** url) override  
*Overriden [vxg::media::ffmpeg::Sink::init](#)( **std::string**, **std::string**) "init" method with hidden output ffmpeg format.*
- virtual **std::string** [name](#) () override  
*Sink name.*
- virtual bool [droppable](#) () override  
*If sink of with dropping its media frames.*
- bool [negotiate](#) ( **std::vector**< [Streamer::StreamInfo](#) > streams\_info)  
*Override [negotiate\(\)](#) for removing all data streams.*

## Additional Inherited Members

### 10.42.1 Detailed Description

RTMP sink class.

Definition at line 13 of file [rtmp\\_sink.h](#).

### 10.42.2 Constructor & Destructor Documentation

#### 10.42.2.1 [rtmp\\_sink\(\)](#)

```
vxg::media::rtmp_sink::rtmp_sink ( ) [inline]
```

Construct a new rtmp sink object.

Definition at line 18 of file [rtmp\\_sink.h](#).

### 10.42.3 Member Function Documentation

#### 10.42.3.1 [droppable\(\)](#)

```
virtual bool vxg::media::rtmp_sink::droppable ( ) [inline], [override], [virtual]
```

If sink of with dropping its media frames.

#### Returns

- true Internal media thread allowed to drop frames if internal media queue is full.
- false No media frames dropping allowed.

Reimplemented from [vxg::media::ffmpeg::Sink](#).

Definition at line 32 of file [rtmp\\_sink.h](#).

### 10.42.3.2 init()

```
virtual bool vxg::media::rtmp_sink::init (
    std::string url ) [inline], [override], [virtual]
```

Overriden [vxg::media::ffmpeg::Sink::init](#)( **std::string**, **std::string**) "init" method with hidden output ffmpeg format.

## Parameters

<i>url</i>	RTMP url
------------	----------

## Returns

true On success

false On failure

Reimplemented from [vsg::media::ffmpeg::Sink](#).

Definition at line 26 of file `rtmp_sink.h`.

**10.42.3.3 name()**

```
virtual std::string vsg::media::rtmp_sink::name ( ) [inline], [override], [virtual]
```

Sink name.

## Returns

**std::string**

Reimplemented from [vsg::media::ffmpeg::Sink](#).

Definition at line 30 of file `rtmp_sink.h`.

**10.42.3.4 negotiate()**

```
bool vsg::media::rtmp_sink::negotiate (
    std::vector< Streamer::StreamInfo > streams_info ) [inline], [virtual]
```

Override [negotiate\(\)](#) for removing all data streams.

This is required for preventing buffering inside the ffmpeg muxer, ffmpeg waits for at least one packet for each stream or 10 seconds by default before output next chunk, this leads to 10 seconds delay if data track was added to output muxing context but no actual data packets were received hence sparse streams like onvif metadata may significantly increase delay.

## Parameters

<i>in</i>	<i>streams_info</i>	- list of streams descriptions.
-----------	---------------------	---------------------------------

## Returns

true  
false

Reimplemented from [vxg::media::ffmpeg::Sink](#).

Definition at line 45 of file rtmp\_sink.h.

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

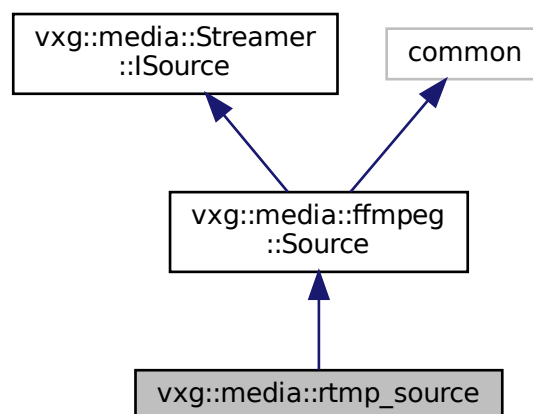
- [rtmp\\_sink.h](#)

## 10.43 vxg::media::rtmp\_source Class Reference

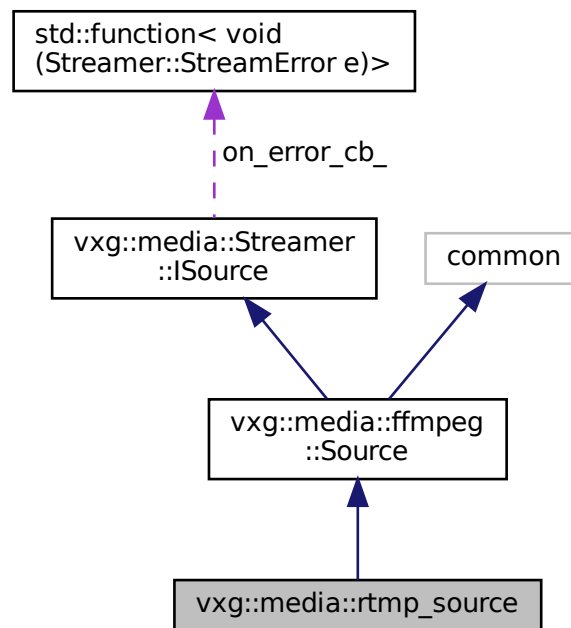
RTMP source class.

```
#include <streamer/rtmp_source.h>
```

Inheritance diagram for vxg::media::rtmp\_source:



Collaboration diagram for vxg::media::rtmp\_source:



## Public Member Functions

- virtual bool `init` ( `std::string` url)  
*Init source with url.*

## Additional Inherited Members

### 10.43.1 Detailed Description

RTMP source class.

Definition at line 13 of file rtmp\_source.h.

### 10.43.2 Member Function Documentation

#### 10.43.2.1 `init()`

```
virtual bool vxg::media::rtmp_source::init (
    std::string url ) [inline], [virtual]
```

Init source with url.

## Parameters

<code>in</code>	<code>url</code>	RTMP url
-----------------	------------------	----------

## Returns

true Success

false Failed

Reimplemented from [vxg::media::ffmpeg::Source](#).

Definition at line 24 of file `rtsp_source.h`.

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

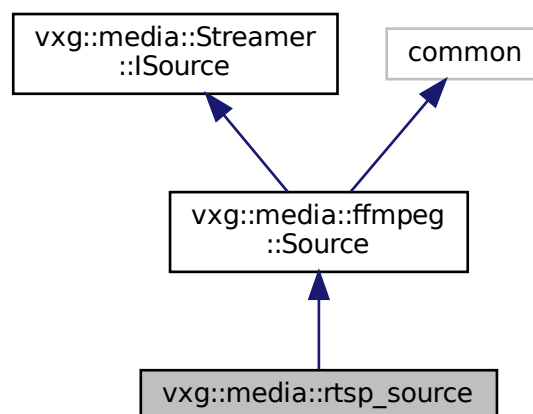
- [rtsp\\_source.h](#)

## 10.44 vxg::media::rtsp\_source Class Reference

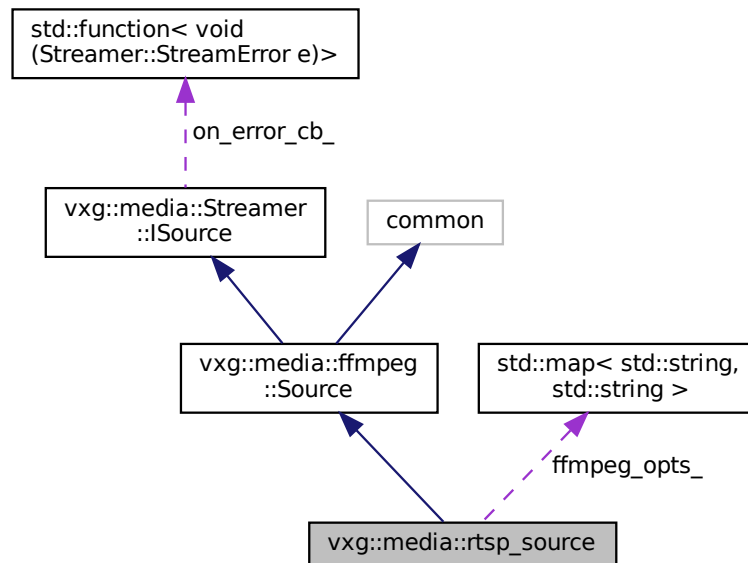
RTSP source class.

```
#include <streamer/rtsp_source.h>
```

Inheritance diagram for vxg::media::rtsp\_source:



Collaboration diagram for vxg::media::rtsp\_source:



## Public Member Functions

- `rtsp_source` (bool rtp\_over\_tcp=true, `std::vector< Streamer::MediaType >` media\_types= `std::vector< Streamer::MediaType >(0)`)  
Construct a new rtsp source object.
- `rtsp_source` ( `std::string` rtp\_transport="tcp", `std::vector< Streamer::MediaType >` media\_types= `std::vector< Streamer::MediaType >(0)`, `std::map< std::string, std::string >` ffmpeg\_opts={}, `std::chrono::seconds` timeout= `std::chrono::seconds(0)`)  
Construct a new rtsp source object.
- virtual bool `init` ( `std::string` url)  
Overloaded init method.
- virtual `std::string` `name` () override  
Source class name.

## Protected Attributes

- `std::map< std::string, std::string >` `ffmpeg_opts_`

## Additional Inherited Members

### 10.44.1 Detailed Description

RTSP source class.

Definition at line 13 of file `rtsp_source.h`.



## 10.44.2 Constructor & Destructor Documentation

### 10.44.2.1 rtsp\_source() [1/2]

```
vxg::media::rtsp_source::rtsp_source (
    bool rtp_over_tcp = true,
    std::vector< Streamer::MediaType > media_types = std::vector<Streamer::MediaType>(0)
) [inline]
```

Construct a new rtsp source object.

#### Parameters

in	<i>rtp_over_tcp</i>	Flag indicates if user wants RTP over TCP
in	<i>media_types</i>	List of media types to ask from RTSP server, can be used to filter out unnecessary tracks. If empty all types will be requested.

Definition at line 31 of file rtsp\_source.h.

### 10.44.2.2 rtsp\_source() [2/2]

```
vxg::media::rtsp_source::rtsp_source (
    std::string rtp_transport = "tcp",
    std::vector< Streamer::MediaType > media_types = std::vector<Streamer::MediaType>(0),
    std::map< std::string, std::string > ffmpeg_opts = {},
    std::chrono::seconds timeout = std::chrono::seconds(0) ) [inline]
```

Construct a new rtsp source object.

#### Parameters

in	<i>rtp_transport</i>	RTP transport passed directly to ffmpeg.
in	<i>media_types</i>	List of media types to ask from RTSP server, can be used to filter out unnecessary tracks. If empty all types will be requested.
in	<i>ffmpeg_opts</i>	Map of ffmpeg options key values pairs.
in	<i>timeout</i>	RTSP client io timeout. Doesn't mean the connection will be closed after this timeout but specifies the amount of time ffmpeg spends in io loop spinning, infinite timeout causes spinning forever if connection wasn't closed but no data was received.

Definition at line 51 of file rtsp\_source.h.

## 10.44.3 Member Function Documentation

### 10.44.3.1 init()

```
virtual bool vxg::media::rtsp_source::init (
    std::string url ) [inline], [virtual]
```

Overloaded init method.

#### Parameters

in	url	RTSP URL link
----	-----	---------------

#### Returns

true  
false

Reimplemented from [vxg::media::ffmpeg::Source](#).

Definition at line 69 of file rtsp\_source.h.

### 10.44.3.2 name()

```
virtual std::string vxg::media::rtsp_source::name ( ) [inline], [override], [virtual]
```

Source class name.

#### Returns

**std::string**

Reimplemented from [vxg::media::ffmpeg::Source](#).

Definition at line 165 of file rtsp\_source.h.

## 10.44.4 Field Documentation

### 10.44.4.1 ffmpeg\_opts\_

```
std::map< std::string, std::string> vxg::media::rtsp_source::ffmpeg_opts_ [protected]
```

Definition at line 22 of file rtsp\_source.h.

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

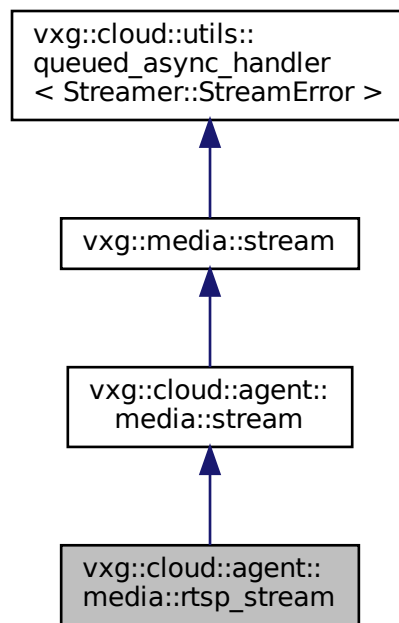
- [rtsp\\_source.h](#)

## 10.45 vxg::cloud::agent::media::rtsp\_stream Class Reference

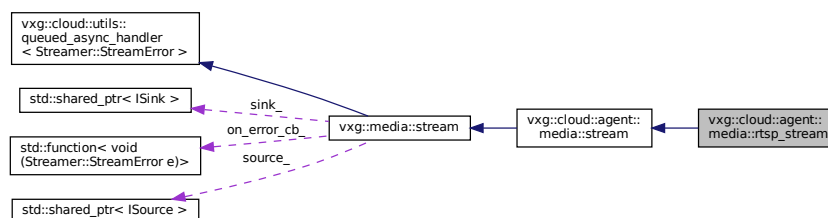
Implementation of the [media::stream](#) with RTSP source and NIY stubs.

```
#include <agent/rtsp-stream.h>
```

Inheritance diagram for vxg::cloud::agent::media::rtsp\_stream:



Collaboration diagram for vxg::cloud::agent::media::rtsp\_stream:



### Public Types

- typedef `std::shared_ptr< rtsp_stream > ptr`

## Public Member Functions

- `rtsp_stream` ( `std::string` source\_url, `std::string` name, bool rtp\_transport\_tcp=true, bool recorder\_needs\_source=false)  
*Construct a new rtsp stream object.*
- virtual `~rtsp_stream` ()
- virtual bool `start` ( `std::string` not\_used="")
- bool `get_supported_stream` (proto::supported\_stream\_config &config)
- virtual bool `get_stream_caps` (proto::stream\_caps &caps) override  
*Get the media stream caps.*
- virtual bool `get_stream_config` (proto::stream\_config &streamConfig)  
*Get the stream config.*
- virtual bool `set_stream_config` (const proto::stream\_config &streamConfig)  
*Set the streams config.*
- virtual bool `get_snapshot` (proto::event\_object::snapshot\_info\_object &snapshot)
- virtual `std::vector< proto::video_clip_info >` `record_get_list` (cloud::time begin, cloud::time end, bool align)  
*Get list of the recorded clips for specific time period.*
- virtual `proto::video_clip_info` `record_export` (cloud::time begin, cloud::time end)  
*Export recorded clip for specified time.*
- virtual bool `start_record` ()  
*Start recording of this media stream.*
- virtual bool `stop_record` ()  
*Stop recording of this stream.*

## Additional Inherited Members

### 10.45.1 Detailed Description

Implementation of the `media::stream` with RTSP source and NIY stubs.

Definition at line 17 of file `rtsp-stream.h`.

### 10.45.2 Member Typedef Documentation

#### 10.45.2.1 ptr

```
typedef std::shared_ptr<rtsp_stream> vxg::cloud::agent::media::rtsp_stream::ptr
```

Definition at line 33 of file `rtsp-stream.h`.

### 10.45.3 Constructor & Destructor Documentation

#### 10.45.3.1 rtsp\_stream()

```
vxg::cloud::agent::media::rtsp_stream::rtsp_stream (
    std::string source_url,
    std::string name,
    bool rtp_transport_tcp = true,
    bool recorder_needs_source = false ) [inline]
```

Construct a new rtsp stream object.

## Parameters

<i>source_url</i>	RTSP url
<i>name</i>	Unique stream name
<i>rtp_transport_tcp</i>	true - RTP over TCP; false - RTP over UDP
<i>record_needs_source</i>	Indicates if stream needs source start before calling <a href="#">start_record()</a> virtual method.

Definition at line 42 of file rtsp-stream.h.

### 10.45.3.2 ~rtsp\_stream()

```
virtual vxg::cloud::agent::media::rtsp_stream::~~rtsp_stream ( ) [inline], [virtual]
```

Definition at line 54 of file rtsp-stream.h.

## 10.45.4 Member Function Documentation

### 10.45.4.1 get\_snapshot()

```
virtual bool vxg::cloud::agent::media::rtsp_stream::get_snapshot (
    proto::event_object::snapshot_info_object & snapshot ) [inline], [virtual]
```

Definition at line 89 of file rtsp-stream.h.

### 10.45.4.2 get\_stream\_caps()

```
virtual bool vxg::cloud::agent::media::rtsp_stream::get_stream_caps (
    proto::stream_caps & caps ) [inline], [override], [virtual]
```

Get the media stream caps.

video/audio elementary streams caps request passes caps with names of the elementary streams for which caps are required to be filled inside this method

## Parameters

out	<i>caps</i>	
-----	-------------	--

**Returns**

true if caps valid  
false if caps is invalid

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 71 of file rtsp-stream.h.

**10.45.4.3 get\_stream\_config()**

```
virtual bool vxg::cloud::agent::media::rtsp_stream::get_stream_config (
    proto::stream_config & config ) [inline], [virtual]
```

Get the stream config.

**Parameters**

<i>in, out</i>	<i>config</i>	input config contains list of streams for which configuration should be returned
----------------	---------------	--

**Returns**

true if config is valid  
false if config is invalid

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 77 of file rtsp-stream.h.

**10.45.4.4 get\_supported\_stream()**

```
bool vxg::cloud::agent::media::rtsp_stream::get_supported_stream (
    proto::supported_stream_config & config ) [inline]
```

Definition at line 60 of file rtsp-stream.h.

**10.45.4.5 record\_export()**

```
virtual proto::video_clip_info vxg::cloud::agent::media::rtsp_stream::record_export (
    cloud::time begin,
    cloud::time end ) [inline], [virtual]
```

Export recorded clip for specified time.

## Parameters

<i>begin</i>	
<i>end</i>	

## Returns

[proto::video\\_clip\\_info](#)

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 104 of file rtsp-stream.h.

## 10.45.4.6 record\_get\_list()

```
virtual std::vector<proto::video\_clip\_info> vxg::cloud::agent::media::rtsp_stream::record_↔
get_list (
    cloud::time begin,
    cloud::time end,
    bool align ) [inline], [virtual]
```

Get list of the recorded clips for specific time period.

## Parameters

in	<i>begin</i>	beginning of the time period
in	<i>end</i>	ending of the time period
in	<i>align</i>	Align returned records to key frames and begin/end. If true the implementation should align returned records to not include data with timestamps less than <i>begin</i> and greater than <i>end</i> . Also any returned record MUST start with key frame and the last frame of any not last record in the list MUST be the frame prior to key frame - first frame of the next record.
in	<i>limit</i>	Max records number that may be returned. Value 0 means no limitation.

## Returns

std::vector<[proto::video\\_clip\\_info](#)>

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 97 of file rtsp-stream.h.

## 10.45.4.7 set\_stream\_config()

```
virtual bool vxg::cloud::agent::media::rtsp_stream::set_stream_config (
    const proto::stream\_config & config ) [inline], [virtual]
```

Set the streams config.

**Parameters**

<code>in</code>	<code>config</code>	input <code>config</code> contains list of streams for which configuration should be set
-----------------	---------------------	--

**Returns**

`true` if `config` successfully set  
`false` if `config` failed to set

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 83 of file `rtsp-stream.h`.

**10.45.4.8 start()**

```
virtual bool vxg::cloud::agent::media::rtsp_stream::start (
    std::string not_used = "" ) [inline], [virtual]
```

Reimplemented from [vxg::media::stream](#).

Definition at line 56 of file `rtsp-stream.h`.

**10.45.4.9 start\_record()**

```
virtual bool vxg::cloud::agent::media::rtsp_stream::start_record ( ) [inline], [virtual]
```

Start recording of this media stream.

Called only if memory card is presented and can be used.

**Returns**

`true` if recording started  
`false` if recording start failed

**See also**

`agent::event_stream::on_get_memorycard_info`

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 112 of file `rtsp-stream.h`.



#### 10.45.4.10 stop\_record()

```
virtual bool vxg::cloud::agent::media::rtsp_stream::stop_record ( ) [inline], [virtual]
```

Stop recording of this stream.

##### Returns

true Stopped  
false Failed to stop

Implements [vxg::cloud::agent::media::stream](#).

Definition at line 118 of file rtsp-stream.h.

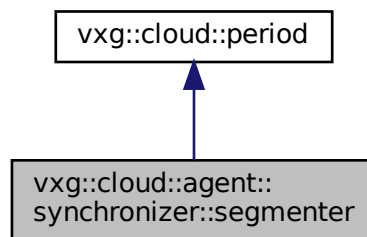
The documentation for this class was generated from the following file:

- [rtsp-stream.h](#)

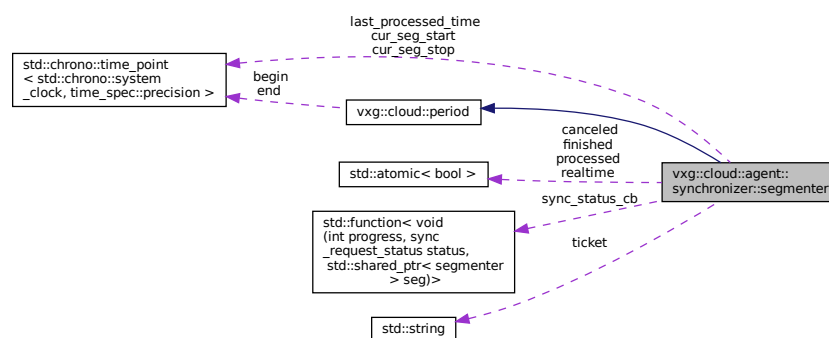
## 10.46 vxg::cloud::agent::synchronizer::segmenter Struct Reference

```
#include <agent/timeline-synchronizer.h>
```

Inheritance diagram for vxg::cloud::agent::synchronizer::segmenter:



Collaboration diagram for vxg::cloud::agent::synchronizer::segmenter:



## Public Types

- typedef **std::shared\_ptr**< [segmenter](#) > [ptr](#)

## Public Member Functions

- virtual [~segmenter](#) ()
- bool [operator](#)< (const [segmenter](#) &r)
- bool [intersects](#) (const [segmenter](#) &r)

## Data Fields

- [cloud::time](#) [cur\\_seg\\_start](#)
- [cloud::time](#) [cur\\_seg\\_stop](#)
- [cloud::time](#) [last\\_processed\\_time](#)
- [cloud::duration](#) [step](#)
- [cloud::duration](#) [delay](#)
- **std::atomic**< bool > [processed](#)  
*Processing finished, doesn't mean upload of all processed chunks is finished.*
- **std::atomic**< bool > [canceled](#)  
*Canceled.*
- **std::atomic**< bool > [finished](#)  
*Upload of all processed chunks finished, no matter what was result of the chunk upload attempt.*
- **std::atomic**< bool > [realtime](#)  
*Realtime delay between chunks processing.*
- **std::string** [ticket](#)
- [size\\_t](#) [chunks\\_planned](#)
- [size\\_t](#) [chunks\\_done](#)
- [size\\_t](#) [chunks\\_failed](#)
- [sync\\_status\\_report\\_cb](#) [sync\\_status\\_cb](#)
- bool [final\\_sync\\_status\\_reported](#)

### 10.46.1 Detailed Description

Definition at line 32 of file `timeline-synchronizer.h`.

### 10.46.2 Member Typedef Documentation

#### 10.46.2.1 ptr

```
typedef std::shared_ptr<segmenter> vxg::cloud::agent::synchronizer::segmenter::ptr
```

Definition at line 72 of file `timeline-synchronizer.h`.

## 10.46.3 Constructor & Destructor Documentation

### 10.46.3.1 ~segmenter()

```
virtual vxg::cloud::agent::synchronizer::segmenter::~~segmenter ( ) [inline], [virtual]
```

Definition at line 55 of file timeline-synchronizer.h.

## 10.46.4 Member Function Documentation

### 10.46.4.1 intersects()

```
bool vxg::cloud::agent::synchronizer::segmenter::intersects (
    const segmenter & r ) [inline]
```

Definition at line 61 of file timeline-synchronizer.h.

### 10.46.4.2 operator<()

```
bool vxg::cloud::agent::synchronizer::segmenter::operator< (
    const segmenter & r ) [inline]
```

Definition at line 57 of file timeline-synchronizer.h.

## 10.46.5 Field Documentation

### 10.46.5.1 canceled

```
std::atomic<bool> vxg::cloud::agent::synchronizer::segmenter::canceled
```

Canceled.

Definition at line 42 of file timeline-synchronizer.h.

#### 10.46.5.2 chunks\_done

```
size_t vxg::cloud::agent::synchronizer::segmenter::chunks_done
```

Definition at line 50 of file timeline-synchronizer.h.

#### 10.46.5.3 chunks\_failed

```
size_t vxg::cloud::agent::synchronizer::segmenter::chunks_failed
```

Definition at line 51 of file timeline-synchronizer.h.

#### 10.46.5.4 chunks\_planned

```
size_t vxg::cloud::agent::synchronizer::segmenter::chunks_planned
```

Definition at line 49 of file timeline-synchronizer.h.

#### 10.46.5.5 cur\_seg\_start

```
cloud::time vxg::cloud::agent::synchronizer::segmenter::cur_seg_start
```

Definition at line 33 of file timeline-synchronizer.h.

#### 10.46.5.6 cur\_seg\_stop

```
cloud::time vxg::cloud::agent::synchronizer::segmenter::cur_seg_stop
```

Definition at line 34 of file timeline-synchronizer.h.

#### 10.46.5.7 delay

```
cloud::duration vxg::cloud::agent::synchronizer::segmenter::delay
```

Definition at line 37 of file timeline-synchronizer.h.

#### 10.46.5.8 final\_sync\_status\_reported

```
bool vxg::cloud::agent::synchronizer::segmenter::final_sync_status_reported
```

Definition at line 53 of file timeline-synchronizer.h.

#### 10.46.5.9 finished

```
std::atomic<bool> vxg::cloud::agent::synchronizer::segmenter::finished
```

Upload of all processed chunks finished, no matter what was result of the chunk upload attempt.

Definition at line 45 of file timeline-synchronizer.h.

#### 10.46.5.10 last\_processed\_time

```
cloud::time vxg::cloud::agent::synchronizer::segmenter::last_processed_time
```

Definition at line 35 of file timeline-synchronizer.h.

#### 10.46.5.11 processed

```
std::atomic<bool> vxg::cloud::agent::synchronizer::segmenter::processed
```

Processing finished, doesn't mean upload of all processed chunks is finished.

Definition at line 40 of file timeline-synchronizer.h.

#### 10.46.5.12 realtime

```
std::atomic<bool> vxg::cloud::agent::synchronizer::segmenter::realtime
```

Realtime delay between chunks processing.

Definition at line 47 of file timeline-synchronizer.h.

#### 10.46.5.13 step

`cloud::duration vxg::cloud::agent::synchronizer::segmenter::step`

Definition at line 36 of file timeline-synchronizer.h.

#### 10.46.5.14 sync\_status\_cb

`sync_status_report_cb vxg::cloud::agent::synchronizer::segmenter::sync_status_cb`

Definition at line 52 of file timeline-synchronizer.h.

#### 10.46.5.15 ticket

`std::string vxg::cloud::agent::synchronizer::segmenter::ticket`

Definition at line 48 of file timeline-synchronizer.h.

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

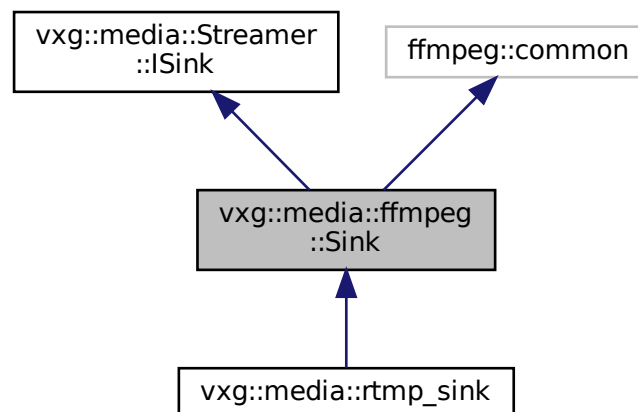
- [timeline-synchronizer.h](#)

## 10.47 vxg::media::ffmpeg::Sink Class Reference

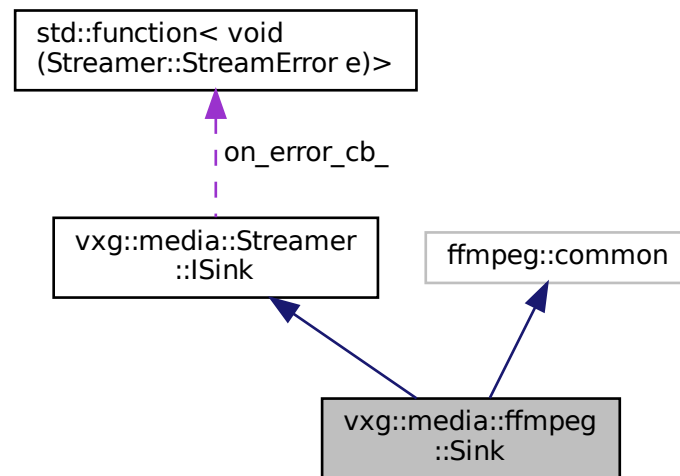
Base ffmpeg sink class.

```
#include <streamer/ffmpeg_sink.h>
```

Inheritance diagram for vxg::media::ffmpeg::Sink:



Collaboration diagram for vxg::media::ffmpeg::Sink:



## Public Member Functions

- [Sink](#) ()
- virtual [~Sink](#) ()
- bool [init](#) ( [std::string](#) url, [std::string](#) fmt, [std::shared\\_ptr](#)< [std::vector](#)< [uint8\\_t](#) >> data\_buffer=nullptr)  
*Sink init.*
- virtual bool [init](#) ( [std::string](#) url="")  
*Init sink.*
- virtual bool [finit](#) ()  
*Deinit sink.*
- virtual void [stop](#) ()
- virtual void [error](#) ([Streamer::StreamError](#) stream\_error)  
*Media processing error callback, called when ISink::process returned false or linked source's ISource::pullFrame returned false, or when ISource::error was called.*
- virtual [std::string](#) [name](#) ()  
*Sink name.*
- virtual bool [droppable](#) ()  
*If sink of with dropping its media frames.*
- virtual bool [negotiate](#) ( [std::vector](#)< [Streamer::StreamInfo](#) >)  
*Negotiation callback, this method called with collected from the ISource::negotiate media stream description.*
- virtual [cloud::duration](#) [duration](#) ()  
*Processed stream duration.*

## Additional Inherited Members

### 10.47.1 Detailed Description

Base ffmpeg sink class.

Definition at line 12 of file `ffmpeg_sink.h`.

## 10.47.2 Constructor & Destructor Documentation

### 10.47.2.1 Sink()

```
vxg::media::ffmpeg::Sink::Sink ( )
```

### 10.47.2.2 ~Sink()

```
virtual vxg::media::ffmpeg::Sink::~Sink ( ) [virtual]
```

## 10.47.3 Member Function Documentation

### 10.47.3.1 droppable()

```
virtual bool vxg::media::ffmpeg::Sink::droppable ( ) [inline], [virtual]
```

If sink of with dropping its media frames.

#### Returns

- true Internal media thread allowed to drop frames if internal media queue is full.
- false No media frames dropping allowed.

Implements [vxg::media::Streamer::ISink](#).

Reimplemented in [vxg::media::rtmp\\_sink](#).

Definition at line 57 of file `ffmpeg_sink.h`.

### 10.47.3.2 duration()

```
virtual cloud::duration vxg::media::ffmpeg::Sink::duration ( ) [inline], [virtual]
```

Processed stream duration.

#### Returns

- duration

Reimplemented from [vxg::media::Streamer::ISink](#).

Definition at line 59 of file `ffmpeg_sink.h`.

### 10.47.3.3 error()

```
virtual void vxg::media::ffmpeg::Sink::error (
    Streamer::StreamError error ) [inline], [virtual]
```

Media processing error callback, called when `ISink::process` returned false or linked source's `ISource::pullFrame` returned false, or when `ISource::error` was called.

Method may be overridden, default implementation calls `on_error_cb` that was provided by user with [set\\_error\\_cb\(\)](#).



## Parameters

<i>error</i>	Error type.
--------------	-------------

Reimplemented from [vxg::media::Streamer::ISink](#).

Definition at line 33 of file `ffmpeg_sink.h`.

10.47.3.4 `finit()`

```
virtual bool vxg::media::ffmpeg::Sink::finit ( ) [virtual]
```

Deinit sink.

## Returns

true finit success.

false finit failed.

Implements [vxg::media::Streamer::ISink](#).

10.47.3.5 `init()` [1/2]

```
bool vxg::media::ffmpeg::Sink::init (
    std::string url,
    std::string fmt,
    std::shared_ptr< std::vector< uint8_t >> data_buffer = nullptr )
```

[Sink](#) init.

## Parameters

<i>url</i>	Output url
<i>fmt</i>	Output format
<i>data_buffer</i>	Output buffer for output to memory, if specified and not nullptr the <code>url</code> will be ignored.

## Returns

true On success

false On failure

**10.47.3.6 init()** [2/2]

```
virtual bool vxg::media::ffmpeg::Sink::init (
    std::string url = "" ) [virtual]
```

Init sink.

**Parameters**

in	url	Url if needed.
----	-----	----------------

**Returns**

true init success.  
false init failed.

Implements [vxg::media::Streamer::ISink](#).

Reimplemented in [vxg::media::rtmp\\_sink](#).

**10.47.3.7 name()**

```
virtual std::string vxg::media::ffmpeg::Sink::name ( ) [inline], [virtual]
```

[Sink](#) name.

**Returns**

**std::string**

Implements [vxg::media::Streamer::ISink](#).

Reimplemented in [vxg::media::rtmp\\_sink](#).

Definition at line 55 of file `ffmpeg_sink.h`.

**10.47.3.8 negotiate()**

```
virtual bool vxg::media::ffmpeg::Sink::negotiate (
    std::vector< Streamer::StreamInfo > info ) [virtual]
```

Negotiation callback, this method called with collected from the `ISource::negotiate` media stream description.

**Parameters**

info	List of elementary streams descriptions.
------	--

**Returns**

true If streams descriptions accepted.  
false Streams not accepted, will cause media thread stopping.

Reimplemented from [vxg::media::Streamer::ISink](#).

Reimplemented in [vxg::media::rtmp\\_sink](#).

**10.47.3.9 stop()**

```
virtual void vxg::media::ffmpeg::Sink::stop ( ) [virtual]
```

Reimplemented from [vxg::media::Streamer::ISink](#).

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

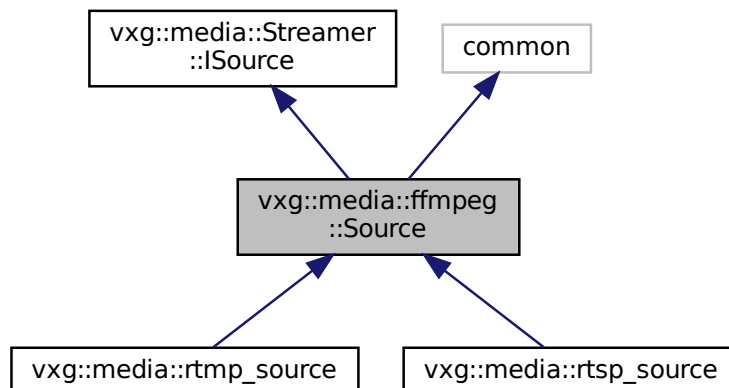
- [ffmpeg\\_sink.h](#)

**10.48 vxg::media::ffmpeg::Source Class Reference**

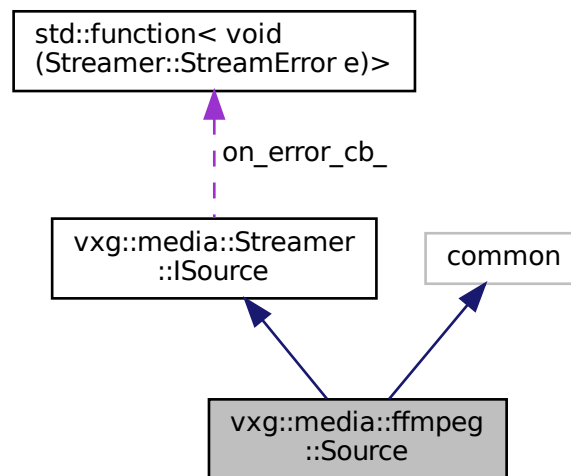
Base ffmpeg source class.

```
#include <streamer/ffmpeg_source.h>
```

Inheritance diagram for vxg::media::ffmpeg::Source:



Collaboration diagram for vxg::media::ffmpeg::Source:



## Public Member Functions

- [Source](#) ()
- virtual [~Source](#) ()
- bool [init](#) ( [std::string](#) url, AVDictionary \*opts, [std::string](#) fmt="" )  
*Init ffmpeg source with specific ffmpeg options.*
- bool [init](#) ( [std::shared\\_ptr](#)< [std::vector](#)< uint8\_t >> input\_buffer, AVDictionary \*opts, [std::string](#) fmt )  
*Init ffmpeg memory source with specific ffmpeg options.*
- virtual bool [init](#) ( [std::string](#) url="" )  
*Init source.*
- virtual void [finit](#) ()  
*Finit souce.*
- virtual [std::shared\\_ptr](#)< [Streamer::MediaFrame](#) > [pullFrame](#) ()  
*Main method of the Mode::PULL mode data producing.*
- virtual [std::string](#) [name](#) ()  
*Source class name.*
- virtual [std::vector](#)< [Streamer::StreamInfo](#) > [negotiate](#) ()  
*Negotiation callback.*
- virtual void [stop](#) ()

## Additional Inherited Members

### 10.48.1 Detailed Description

Base ffmpeg source class.

Definition at line 10 of file ffmpeg\_source.h.

## 10.48.2 Constructor & Destructor Documentation

### 10.48.2.1 Source()

```
vxg::media::ffmpeg::Source::Source ( )
```

Definition at line 9 of file `ffmpeg_source.cc`.

### 10.48.2.2 ~Source()

```
vxg::media::ffmpeg::Source::~Source ( ) [virtual]
```

Definition at line 12 of file `ffmpeg_source.cc`.

## 10.48.3 Member Function Documentation

### 10.48.3.1 finit()

```
void vxg::media::ffmpeg::Source::finit ( ) [virtual]
```

Finit souce.

Implements [vxg::media::Streamer::ISource](#).

Definition at line 30 of file `ffmpeg_source.cc`.

### 10.48.3.2 init() [1/3]

```
bool vxg::media::ffmpeg::Source::init (
    std::shared_ptr< std::vector< uint8_t >> input_buffer,
    AVDictionary * opts,
    std::string fmt )
```

Init ffmpeg memory source with specific ffmpeg options.

#### Parameters

in	<i>input_buffer</i>	Input memory buffer containing whole media.
in	<i>opts</i>	ffmpeg options
in	<i>fmt</i>	ffmpeg input format to prevent auto-detection. ex.: "flv", "mp4", "http" etc.

**Returns**

true  
false

Definition at line 20 of file ffmpeg\_source.cc.

**10.48.3.3 init() [2/3]**

```
bool vxg::media::ffmpeg::Source::init (
    std::string url,
    AVDictionary * opts,
    std::string fmt = "" )
```

Init ffmpeg source with specific ffmpeg options.

**Parameters**

in	<i>url</i>	Url
in	<i>opts</i>	ffmpeg options
in	<i>fmt</i>	ffmpeg input format to prevent auto-detection. ex.: "flv", "rtsp", "http" etc.

**Returns**

true  
false

Definition at line 14 of file ffmpeg\_source.cc.

**10.48.3.4 init() [3/3]**

```
bool vxg::media::ffmpeg::Source::init (
    std::string url = "" ) [virtual]
```

Init source.

**Parameters**

<i>url</i>	Url if needed.
------------	----------------

**Returns**

true Init success.  
false Init failed.

Implements [vxg::media::Streamer::ISource](#).

Reimplemented in [vxg::media::rtsp\\_source](#), and [vxg::media::rtmp\\_source](#).

Definition at line 26 of file `ffmpeg_source.cc`.

#### 10.48.3.5 name()

```
virtual std::string vxg::media::ffmpeg::Source::name ( ) [inline], [virtual]
```

[Source](#) class name.

Returns

**std::string**

Implements [vxg::media::Streamer::ISource](#).

Reimplemented in [vxg::media::rtsp\\_source](#).

Definition at line 42 of file `ffmpeg_source.h`.

#### 10.48.3.6 negotiate()

```
std::vector< Streamer::StreamInfo > vxg::media::ffmpeg::Source::negotiate ( ) [virtual]
```

Negotiation callback.

Called by internals. Class implementation should return the list of the streams info source will be producing for the sinks, this list will be then passed to the `ISink::negotiate` method.

Returns

**std::vector**<[Streamer::StreamInfo](#)>

Implements [vxg::media::Streamer::ISource](#).

Definition at line 34 of file `ffmpeg_source.cc`.

#### 10.48.3.7 pullFrame()

```
std::shared_ptr< Streamer::MediaFrame > vxg::media::ffmpeg::Source::pullFrame ( ) [virtual]
```

Main method of the `Mode::PULL` mode data producing.

Called by internals if the source operation mode is `Mode::PULL`. Implementation should return media frame object with correctly filled fields.

Returns

**std::shared\_ptr**<[MediaFrame](#)>

Implements [vxg::media::Streamer::ISource](#).

Definition at line 93 of file `ffmpeg_source.cc`.

### 10.48.3.8 stop()

```
void vxg::media::ffmpeg::Source::stop ( ) [virtual]
```

Reimplemented from [vxg::media::Streamer::ISource](#).

Definition at line 186 of file `ffmpeg_source.cc`.

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

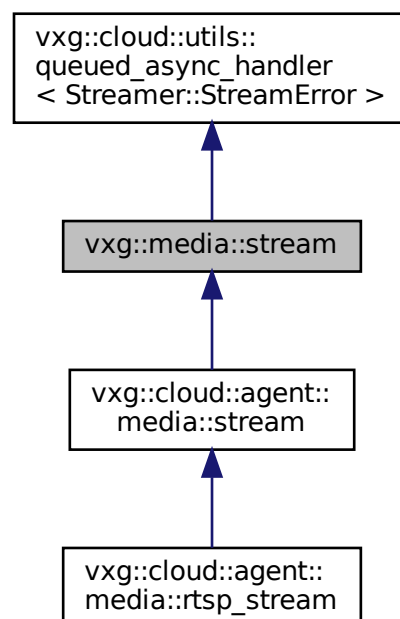
- [ffmpeg\\_source.h](#)
- [ffmpeg\\_source.cc](#)

## 10.49 vxg::media::stream Class Reference

base media stream abstract class

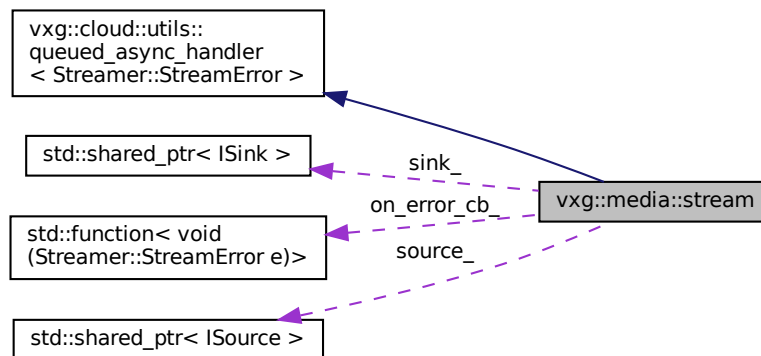
```
#include <streamer/stream.h>
```

Inheritance diagram for `vxg::media::stream`:





Collaboration diagram for vxg::media::stream:



## Public Types

- typedef **std::shared\_ptr**< [stream](#) > [ptr](#)  
*std::shared\_ptr to the base\_stream*

## Public Member Functions

- [stream](#) ( **std::string** name, [Streamer::ISource::ptr](#) source, [Streamer::ISink::ptr](#) sink)  
*Construct a new base stream object.*
- virtual [~stream](#) ()
- virtual bool [init\\_source](#) ( **std::string** url)  
*Initialize the source.*
- virtual void [finit\\_source](#) ()  
*Deinitialize source.*
- virtual bool [init\\_sink](#) ( **std::string** uri)  
*Init media sink.*
- virtual void [finit\\_sink](#) ()  
*Deinitialize sink.*

## Protected Attributes

- [Streamer::on\\_error\\_cb](#) [on\\_error\\_cb\\_](#)
- [Streamer::ISource::ptr](#) [source\\_](#)  
*media source*
- [Streamer::ISink::ptr](#) [sink\\_](#)  
*media sink*

### 10.49.1 Detailed Description

base media stream abstract class

Media stream is the class representing media stream retranslation from the media source derived from the [Streamer::ISource](#) to the media sink derived from the [Streamer::ISink](#). For instance, media stream could be a pair of RTSP source and RTMP sink, i.e. such media stream will be a retranslator of the RTSP stream to the RTMP

Definition at line 23 of file streamer/stream.h.

### 10.49.2 Member Typedef Documentation

#### 10.49.2.1 ptr

```
typedef std::shared_ptr<stream> vxg::media::stream::ptr
```

**std::shared\_ptr** to the base\_stream

Definition at line 44 of file streamer/stream.h.

### 10.49.3 Constructor & Destructor Documentation

#### 10.49.3.1 stream()

```
vxg::media::stream::stream (
    std::string name,
    Streamer::ISource::ptr source,
    Streamer::ISink::ptr sink ) [inline]
```

Construct a new base stream object.

Parameters

<i>name</i>	Unique stream name which will be used by the VXG Cloud API
<i>source</i>	Source object pointer
<i>sink</i>	Sink object pointer

Definition at line 51 of file streamer/stream.h.

#### 10.49.3.2 ~stream()

```
virtual vxg::media::stream::~~stream ( ) [inline], [virtual]
```

Reimplemented in [vxg::cloud::agent::media::stream](#).

Definition at line 67 of file streamer/stream.h.

## 10.49.4 Member Function Documentation

### 10.49.4.1 finit\_sink()

```
virtual void vxg::media::stream::finit_sink ( ) [inline], [virtual]
```

Deinitialize sink.

Derived class deinitialize and deallocates base\_stream::sink\_

Definition at line 118 of file streamer/stream.h.

### 10.49.4.2 finit\_source()

```
virtual void vxg::media::stream::finit_source ( ) [inline], [virtual]
```

Deinitialize source.

Definition at line 90 of file streamer/stream.h.

### 10.49.4.3 init\_sink()

```
virtual bool vxg::media::stream::init_sink (
    std::string uri ) [inline], [virtual]
```

Init media sink.

Derived class should allocate and initialize base\_stream::sink\_ with RTMP sink publishing media stream to the RTMP server pointed by the uri

#### Parameters

in	uri	sink stream url if needed
----	-----	---------------------------

#### Returns

true Sink started

false Sink start failed

Definition at line 105 of file streamer/stream.h.

#### 10.49.4.4 init\_source()

```
virtual bool vxg::media::stream::init_source (
    std::string url ) [inline], [virtual]
```

Initialize the source.

Called by the internal code, derived class should allocate and set base\_stream::source\_ with [Streamer::ISink](#) derived object pointer.

##### Parameters

<i>url</i>	source url
------------	------------

##### Returns

true if successfully initialized source  
false if source initialization failed

Definition at line 79 of file streamer/stream.h.

### 10.49.5 Field Documentation

#### 10.49.5.1 on\_error\_cb\_

```
Streamer::on_error_cb vxg::media::stream::on_error_cb_ [protected]
```

Definition at line 40 of file streamer/stream.h.

#### 10.49.5.2 sink\_

```
Streamer::ISink::ptr vxg::media::stream::sink_ [protected]
```

media sink

Definition at line 231 of file streamer/stream.h.

### 10.49.5.3 source\_

`Streamer::ISource::ptr vxg::media::stream::source_ [protected]`

media source

Definition at line 229 of file streamer/stream.h.

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

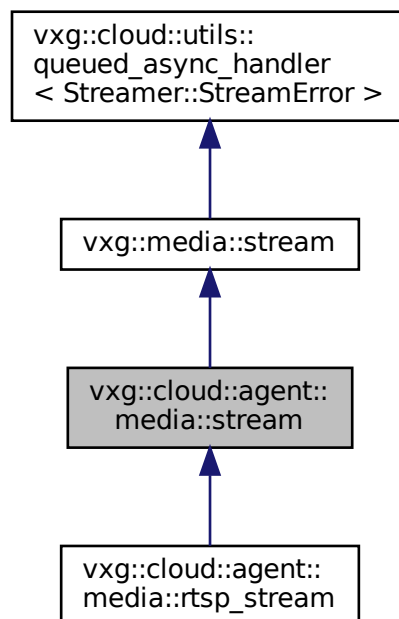
- [streamer/stream.h](#)

## 10.50 vxg::cloud::agent::media::stream Class Reference

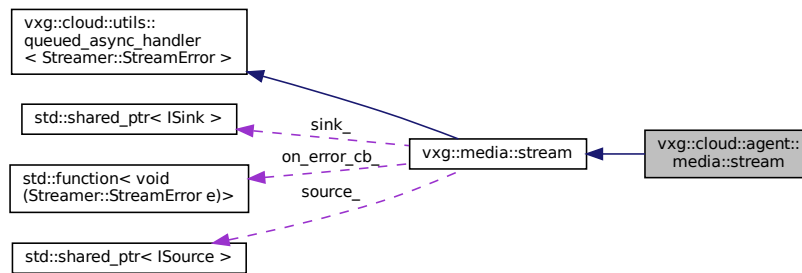
Cloud agent media stream abstract class.

```
#include <agent/stream.h>
```

Inheritance diagram for vxg::cloud::agent::media::stream:



Collaboration diagram for vxg::cloud::agent::media::stream:



## Public Types

- typedef **std::shared\_ptr**< [stream](#) > [ptr](#)  
*std::shared\_ptr to the base\_stream*

## Public Member Functions

- [stream](#) ( **std::string** name, [vxg::media::Streamer::ISource::ptr](#) source, bool recorder\_needs\_source=false)  
*Construct a new agent media stream object.*
- virtual [~stream](#) ()
- virtual bool [get\\_stream\\_caps](#) (cloud::agent::proto::stream\_caps &caps)=0  
*Get the media stream caps.*
- virtual bool [get\\_supported\\_stream](#) (cloud::agent::proto::supported\_stream\_config &supported\_stream)=0  
*Get the supported stream description.*
- virtual bool [get\\_stream\\_config](#) (cloud::agent::proto::stream\_config &config)=0  
*Get the stream config.*
- virtual bool [set\\_stream\\_config](#) (const cloud::agent::proto::stream\_config &config)=0  
*Set the streams config.*
- virtual bool [get\\_snapshot](#) (cloud::agent::proto::event\_object::snapshot\_info\_object &snapshot)=0  
*Get the snapshot image of this media stream.*
- virtual bool [record\\_needs\\_source](#) ()  
*Should returns true if [agent::manager](#) should start stream source before calling [start\\_record\(\)](#)*
- virtual bool [start\\_record](#) ()=0  
*Start recording of this media stream.*
- virtual bool [stop\\_record](#) ()=0  
*Stop recording of this stream.*
- virtual **std::vector**< [cloud::agent::proto::video\\_clip\\_info](#) > [record\\_get\\_list](#) (cloud::time begin, cloud::time end, bool align=true)=0  
*Get list of the recorded clips for specific time period.*
- virtual [cloud::agent::proto::video\\_clip\\_info](#) [record\\_export](#) (cloud::time begin, cloud::time end)=0  
*Export recorded clip for specified time.*

## Additional Inherited Members

### 10.50.1 Detailed Description

Cloud agent media stream abstract class.

[vxg::media::stream](#) derived class with VXG Cloud proto callbacks

Definition at line 20 of file agent/stream.h.

### 10.50.2 Member Typedef Documentation

#### 10.50.2.1 ptr

```
typedef std::shared_ptr<stream> vxg::cloud::agent::media::stream::ptr
```

**std::shared\_ptr** to the base\_stream

Definition at line 28 of file agent/stream.h.

### 10.50.3 Constructor & Destructor Documentation

#### 10.50.3.1 stream()

```
vxg::cloud::agent::media::stream::stream (
    std::string name,
    vxg::media::Streamer::ISource::ptr source,
    bool recorder_needs_source = false ) [inline]
```

Construct a new agent media stream object.

#### Parameters

in	<i>name</i>	Unique stream name which will be used by the VXG Cloud API
in	<i>source</i>	Source object pointer
in	<i>sink_error_cb</i>	Callback which will be called on sink error
in	<i>recorder_needs_source</i>	Indicates if stream needs source start before calling <a href="#">start_record()</a> virtual method.

Definition at line 38 of file agent/stream.h.

### 10.50.3.2 `~stream()`

```
virtual vxg::cloud::agent::media::stream::~~stream ( ) [inline], [virtual]
```

Reimplemented from [vxg::media::stream](#).

Definition at line 45 of file agent/stream.h.

## 10.50.4 Member Function Documentation

### 10.50.4.1 `get_snapshot()`

```
virtual bool vxg::cloud::agent::media::stream::get_snapshot (
    cloud::agent::proto::event_object::snapshot_info_object & snapshot ) [pure virtual]
```

Get the snapshot image of this media stream.

#### Parameters

out	<i>snapshot</i>	snapshot object
-----	-----------------	-----------------

#### Returns

true if snapshot is valid  
false if snapshot is invalid

### 10.50.4.2 `get_stream_caps()`

```
virtual bool vxg::cloud::agent::media::stream::get_stream_caps (
    cloud::agent::proto::stream_caps & caps ) [pure virtual]
```

Get the media stream caps.

video/audio elementary streams caps request passes caps with names of the elementary streams for which caps are required to be filled inside this method

#### Parameters

out	<i>caps</i>	
-----	-------------	--

#### Returns

true if caps valid  
false if caps is invalid



Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

#### 10.50.4.3 get\_stream\_config()

```
virtual bool vxg::cloud::agent::media::stream::get_stream_config (
    cloud::agent::proto::stream_config & config ) [pure virtual]
```

Get the stream config.

##### Parameters

<i>in, out</i>	<i>config</i>	input config contains list of streams for which configuration should be returned
----------------	---------------	--

##### Returns

true if config is valid  
false if config is invalid

Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

#### 10.50.4.4 get\_supported\_stream()

```
virtual bool vxg::cloud::agent::media::stream::get_supported_stream (
    cloud::agent::proto::supported_stream_config & supported_stream ) [pure virtual]
```

Get the supported stream description.

##### Parameters

<i>out</i>	<i>supported_stream</i>	Stream supported by device
------------	-------------------------	----------------------------

##### Returns

true if supported\_stream is valid  
false if supported\_stream is not valid

#### 10.50.4.5 record\_export()

```
virtual cloud::agent::proto::video_clip_info vxg::cloud::agent::media::stream::record_export (
    cloud::time begin,
    cloud::time end ) [pure virtual]
```

Export recorded clip for specified time.

## Parameters

<i>begin</i>	
<i>end</i>	

## Returns

[proto::video\\_clip\\_info](#)

Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

## 10.50.4.6 record\_get\_list()

```
virtual std::vector<cloud::agent::proto::video_clip_info> vxg::cloud::agent::media::stream<->
::record_get_list (
    cloud::time begin,
    cloud::time end,
    bool align = true ) [pure virtual]
```

Get list of the recorded clips for specific time period.

## Parameters

in	<i>begin</i>	beginning of the time period
in	<i>end</i>	ending of the time period
in	<i>align</i>	Align returned records to key frames and begin/end. If true the implementation should align returned records to not include data with timestamps less than <i>begin</i> and greater than <i>end</i> . Also any returned record MUST start with key frame and the last frame of any not last record in the list MUST be the frame prior to key frame - first frame of the next record.
in	<i>limit</i>	Max records number that may be returned. Value 0 means no limitation.

## Returns

std::vector<proto::video\_clip\_info>

Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

## 10.50.4.7 record\_needs\_source()

```
virtual bool vxg::cloud::agent::media::stream::record_needs_source ( ) [inline], [virtual]
```

Should returns true if [agent::manager](#) should start stream source before calling [start\\_record\(\)](#)

## Returns

true [agent::manager](#) should start stream source  
false [agent::manager](#) may not start stream source

Definition at line 101 of file agent/stream.h.

#### 10.50.4.8 set\_stream\_config()

```
virtual bool vxg::cloud::agent::media::stream::set_stream_config (
    const vxg::cloud::agent::proto::stream_config & config ) [pure virtual]
```

Set the streams config.

##### Parameters

in	<i>config</i>	input config contains list of streams for which configuration should be set
----	---------------	---

##### Returns

true if config successfully set  
false if config failed to set

Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

#### 10.50.4.9 start\_record()

```
virtual bool vxg::cloud::agent::media::stream::start_record ( ) [pure virtual]
```

Start recording of this media stream.

Called only if memory card is presented and can be used.

##### Returns

true if recording started  
false if recording start failed

##### See also

[agent::event\\_stream::on\\_get\\_memorycard\\_info](#)

Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

#### 10.50.4.10 stop\_record()

```
virtual bool vxg::cloud::agent::media::stream::stop_record ( ) [pure virtual]
```

Stop recording of this stream.

##### Returns

true Stopped  
false Failed to stop

Implemented in [vxg::cloud::agent::media::rtsp\\_stream](#).

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

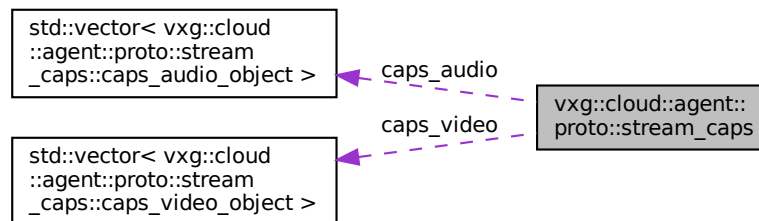
- [agent/stream.h](#)

## 10.51 vxg::cloud::agent::proto::stream\_caps Struct Reference

Media stream capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::stream\_caps:



### Data Structures

- struct [caps\\_audio\\_object](#)  
*Audio streams capabilities.*
- struct [caps\\_video\\_object](#)  
*Video streams capabilities.*

### Data Fields

- **std::vector**< [caps\\_video\\_object](#) > [caps\\_video](#)  
*List of video streams capabilities.*
- **std::vector**< [caps\\_audio\\_object](#) > [caps\\_audio](#)  
*List of audio streams capabilities.*

### 10.51.1 Detailed Description

Media stream capabilities.

Definition at line 175 of file caps.h.

### 10.51.2 Field Documentation

### 10.51.2.1 caps\_audio

`std::vector<caps_audio_object> vxg::cloud::agent::proto::stream_caps::caps_audio`

List of audio streams capabilities.

Definition at line 276 of file caps.h.

### 10.51.2.2 caps\_video

`std::vector<caps_video_object> vxg::cloud::agent::proto::stream_caps::caps_video`

List of video streams capabilities.

Definition at line 274 of file caps.h.

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

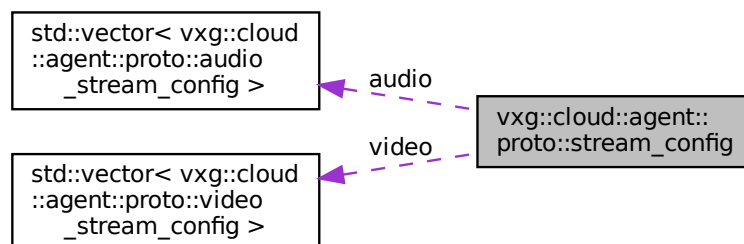
- [caps.h](#)

## 10.52 vxg::cloud::agent::proto::stream\_config Struct Reference

Media stream config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::stream\_config:



### Data Fields

- `std::vector< video\_stream\_config > video`  
List of video media stream configs.
- `std::vector< audio\_stream\_config > audio`  
List of audio media stream configs.

### 10.52.1 Detailed Description

Media stream config.

Definition at line 219 of file config.h.

### 10.52.2 Field Documentation

#### 10.52.2.1 audio

```
std::vector<audio_stream_config> vxg::cloud::agent::proto::stream_config::audio
```

List of audio media stream configs.

Definition at line 223 of file config.h.

#### 10.52.2.2 video

```
std::vector<video_stream_config> vxg::cloud::agent::proto::stream_config::video
```

List of video media stream configs.

Definition at line 221 of file config.h.

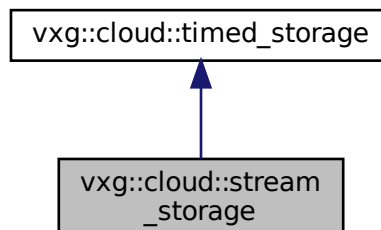
The documentation for this struct was generated from the following file:

- [config.h](#)

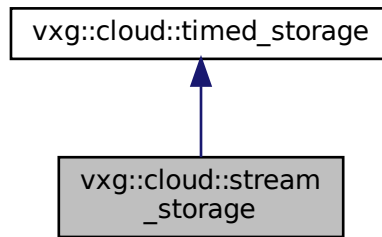
## 10.53 vxg::cloud::stream\_storage Class Reference

```
#include <agent/stream-storage.h>
```

Inheritance diagram for vxg::cloud::stream\_storage:



Collaboration diagram for vxg::cloud::stream\_storage:



## Public Types

- using `ptr` = `shared_ptr< stream_storage >`

## Public Member Functions

- `stream_storage` (`agent::media::stream::ptr` stream)
- virtual `~stream_storage` ()
- virtual `std::vector< item_ptr > list` (`cloud::time` start, `cloud::time` stop) override
- virtual `bool load` (`item_ptr` i) override
- virtual `bool store` (`item_ptr`) override
- virtual `bool store_async` (`item_ptr`, `async_store_finished_cb` finished\_cb, `async_store_is_canceled_cb` is\_↔ canceled\_cb) override
- virtual `void erase` (`item_ptr`)

### 10.53.1 Detailed Description

Definition at line 10 of file stream-storage.h.

### 10.53.2 Member Typedef Documentation

#### 10.53.2.1 ptr

```
using vxg::cloud::stream_storage::ptr = shared_ptr<stream_storage>
```

Definition at line 25 of file stream-storage.h.

### 10.53.3 Constructor & Destructor Documentation

#### 10.53.3.1 `stream_storage()`

```
vxg::cloud::stream_storage::stream_storage (
    agent::media::stream::ptr stream ) [inline]
```

Definition at line 26 of file stream-storage.h.

#### 10.53.3.2 `~stream_storage()`

```
virtual vxg::cloud::stream_storage::~~stream_storage ( ) [inline], [virtual]
```

Definition at line 27 of file stream-storage.h.

### 10.53.4 Member Function Documentation

#### 10.53.4.1 `erase()`

```
virtual void vxg::cloud::stream_storage::erase (
    item_ptr ) [inline], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 64 of file stream-storage.h.

#### 10.53.4.2 `list()`

```
virtual std::vector<item_ptr> vxg::cloud::stream_storage::list (
    cloud::time start,
    cloud::time stop ) [inline], [override], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 29 of file stream-storage.h.



### 10.53.4.3 load()

```
virtual bool vxg::cloud::stream_storage::load (
    item_ptr i ) [inline], [override], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 43 of file stream-storage.h.

### 10.53.4.4 store()

```
virtual bool vxg::cloud::stream_storage::store (
    item_ptr ) [inline], [override], [virtual]
```

Implements [vxg::cloud::timed\\_storage](#).

Definition at line 54 of file stream-storage.h.

### 10.53.4.5 store\_async()

```
virtual bool vxg::cloud::stream_storage::store_async (
    item_ptr ,
    async_store_finished_cb finished_cb,
    async_store_is_canceled_cb is_canceled_cb ) [inline], [override], [virtual]
```

Reimplemented from [vxg::cloud::timed\\_storage](#).

Definition at line 56 of file stream-storage.h.

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

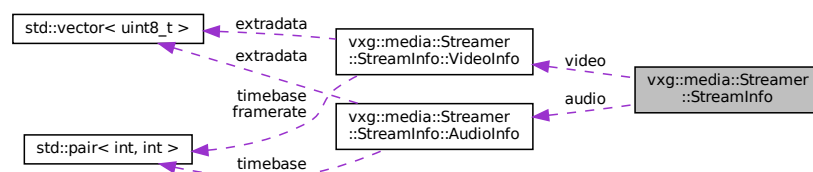
- [stream-storage.h](#)

## 10.54 vxg::media::Streamer::StreamInfo Struct Reference

Stream info description.

```
#include <streamer/base_streamer.h>
```

Collaboration diagram for vxg::media::Streamer::StreamInfo:



## Data Structures

- struct [AudioInfo](#)  
*Audio stream info.*
- struct [VideoInfo](#)  
*Video stream info.*

## Public Types

- enum [StreamType](#) {  
    [ST\\_UNKNOWN](#), [ST\\_VIDEO](#), [ST\\_AUDIO](#), [ST\\_DATA](#),  
    [ST\\_ANY](#) }  
*Stream type.*
- enum [VideoCodec](#) { [VC\\_UNKNOWN](#), [VC\\_H264](#) }  
*Video codec type.*
- enum [AudioCodec](#) {  
    [AC\\_UNKNOWN](#), [AC\\_AAC](#), [AC\\_G711\\_U](#), [AC\\_G711\\_A](#),  
    [AC\\_LPCM](#), [AC\\_G726](#), [AC\\_OPUS](#) }  
*Audio codec.*
- enum [DataCodec](#) { [DC\\_UNKNOWN](#), [DC\\_ONVIF](#) }  
*Data codec.*

## Data Fields

- [StreamType](#) type  
*Stream type.*
- [VideoInfo](#) video  
*Video stream info. Should be filled if stream type is ST\_VIDEO.*
- [AudioInfo](#) audio  
*Audio stream info. Should be filled if stream type is ST\_AUDIO.*

### 10.54.1 Detailed Description

Stream info description.

Definition at line 311 of file base\_streamer.h.

### 10.54.2 Member Enumeration Documentation

#### 10.54.2.1 AudioCodec

```
enum vxg::media::Streamer::StreamInfo::AudioCodec
```

Audio codec.

## Enumerator

AC_UNKNOWN	
AC_AAC	
AC_G711_U	
AC_G711_A	
AC_LPCM	
AC_G726	
AC_OPUS	

Definition at line 351 of file base\_streamer.h.

### 10.54.2.2 DataCodec

```
enum vxg::media::Streamer::StreamInfo::DataCodec
```

Data codec.

## Enumerator

DC_UNKNOWN	
DC_ONVIF	

Definition at line 384 of file base\_streamer.h.

### 10.54.2.3 StreamType

```
enum vxg::media::Streamer::StreamInfo::StreamType
```

Stream type.

## Enumerator

ST_UNKNOWN	
ST_VIDEO	
ST_AUDIO	
ST_DATA	
ST_ANY	

Definition at line 313 of file base\_streamer.h.

#### 10.54.2.4 VideoCodec

```
enum vxg::media::Streamer::StreamInfo::VideoCodec
```

Video codec type.

Enumerator

VC_UNKNOWN	
VC_H264	

Definition at line 316 of file base\_streamer.h.

#### 10.54.3 Field Documentation

##### 10.54.3.1 audio

```
AudioInfo vxg::media::Streamer::StreamInfo::audio
```

Audio stream info. Should be filled if stream type is ST\_AUDIO.

Definition at line 399 of file base\_streamer.h.

##### 10.54.3.2 type

```
StreamType vxg::media::Streamer::StreamInfo::type
```

Stream type.

Definition at line 395 of file base\_streamer.h.

##### 10.54.3.3 video

```
VideoInfo vxg::media::Streamer::StreamInfo::video
```

Video stream info. Should be filled if stream type is ST\_VIDEO.

Definition at line 397 of file base\_streamer.h.

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

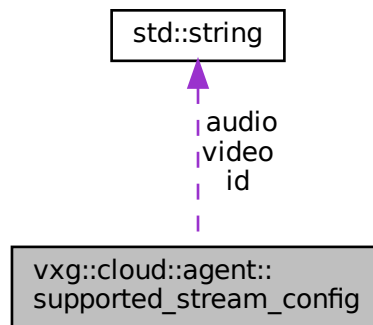
- [base\\_streamer.h](#)

## 10.55 vxg::cloud::agent::supported\_stream\_config Struct Reference

Supported stream config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::supported\_stream\_config:



### Data Fields

- **std::string** `id`  
*id: string, name of media stream, unique for the camera*
- **std::string** `video`  
*video: optional string, video ES that is sent in this media stream*
- **std::string** `audio`  
*audio: optional string, audio ES that is sent in this media stream*

### 10.55.1 Detailed Description

Supported stream config.

Definition at line 1297 of file config.h.

### 10.55.2 Field Documentation

#### 10.55.2.1 audio

**std::string** vxg::cloud::agent::supported\_stream\_config::audio

audio: optional string, audio ES that is sent in this media stream

Definition at line 1303 of file config.h.

### 10.55.2.2 id

```
std::string vxg::cloud::agent::supported_stream_config::id
```

id: string, name of media stream, unique for the camera

Definition at line 1299 of file config.h.

### 10.55.2.3 video

```
std::string vxg::cloud::agent::supported_stream_config::video
```

video: optional string, video ES that is sent in this media stream

Definition at line 1301 of file config.h.

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

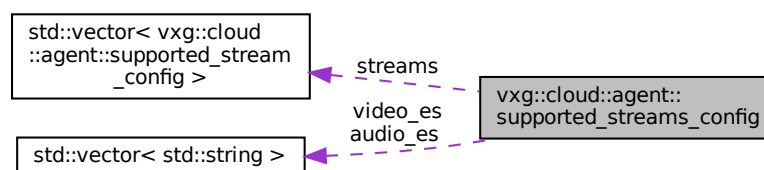
- [config.h](#)

## 10.56 vxg::cloud::agent::supported\_streams\_config Struct Reference

Supported streams config, list of [supported\\_stream\\_config](#).

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::supported\_streams\_config:



### Data Fields

- **std::vector< [supported\\_stream\\_config](#) >** **streams**  
streams: list of [supported\\_stream\\_config](#) struct, camera media streams
- **std::vector< **std::string** >** **video\_es**  
list of string, camera video ES
- **std::vector< **std::string** >** **audio\_es**  
list of string, camera audio ES

## 10.56.1 Detailed Description

Supported streams config, list of [supported\\_stream\\_config](#).

Definition at line 1313 of file config.h.

## 10.56.2 Field Documentation

### 10.56.2.1 audio\_es

```
std::vector< std::string> vxg::cloud::agent::supported_streams_config::audio_es
```

list of string, camera audio ES

Definition at line 1319 of file config.h.

### 10.56.2.2 streams

```
std::vector<supported_stream_config> vxg::cloud::agent::supported_streams_config::streams
```

streams: list of [supported\\_stream\\_config](#) struct, camera media streams

Definition at line 1315 of file config.h.

### 10.56.2.3 video\_es

```
std::vector< std::string> vxg::cloud::agent::supported_streams_config::video_es
```

list of string, camera video ES

Definition at line 1317 of file config.h.

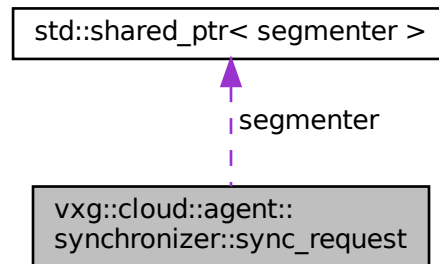
The documentation for this struct was generated from the following file:

- [config.h](#)

## 10.57 vxg::cloud::agent::synchronizer::sync\_request Struct Reference

```
#include <agent/timeline-synchronizer.h>
```

Collaboration diagram for vxg::cloud::agent::synchronizer::sync\_request:



### Data Fields

- [segmenter\\_ptr](#) [segmenter](#)

### 10.57.1 Detailed Description

Definition at line 76 of file timeline-synchronizer.h.

### 10.57.2 Field Documentation

#### 10.57.2.1 segmenter

```
segmenter\_ptr vxg::cloud::agent::synchronizer::sync_request::segmenter
```

Definition at line 77 of file timeline-synchronizer.h.

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

- [timeline-synchronizer.h](#)

## 10.58 vxg::cloud::agent::synchronizer Class Reference

```
#include <agent/timeline-synchronizer.h>
```



## Data Structures

- struct [config](#)
- struct [segmenter](#)
- struct [sync\\_request](#)

## Public Types

- enum [sync\\_request\\_status](#) { [sync\\_request\\_status::PENDING](#), [sync\\_request\\_status::DONE](#), [sync\\_request\\_status::ERROR](#), [sync\\_request\\_status::CANCELED](#) }
- using [sync\\_status\\_report\\_cb](#) = `std::function< void(int progress, sync\_request\_status status, std::shared\_ptr< segmenter > seg)>`
- using [segmenter\\_ptr](#) = `std::shared_ptr< segmenter >`
- using [sync\\_request\\_ptr](#) = `std::shared_ptr< sync\_request >`
- typedef `std::shared_ptr< synchronizer > ptr`

## Public Member Functions

- bool [start](#) ()
- void [stop](#) ()
- [sync\\_request\\_ptr](#) [sync](#) ([cloud::time](#) begin, [cloud::time](#) end=[utils::time::null](#)(), [sync\\_status\\_report\\_cb](#) status\_report\_cb=nullptr, `std::string` upload\_token="", [cloud::duration](#) delay= `std::chrono::microseconds(0)`)
- void [sync\\_finalize](#) ([sync\\_request\\_ptr](#) req, [cloud::time](#) end)
- void [sync\\_cancel](#) (const `std::string` &ticket)

## Static Public Member Functions

- static [ptr](#) [create](#) (const [synchronizer::config](#) &c, [vxg::cloud::sync::timeline\\_ptr](#) s, [vxg::cloud::sync::timeline\\_ptr](#) d)

### 10.58.1 Detailed Description

Definition at line 13 of file timeline-synchronizer.h.

### 10.58.2 Member Typedef Documentation

#### 10.58.2.1 ptr

```
typedef std::shared_ptr<synchronizer> vxg::cloud::agent::synchronizer::ptr
```

Definition at line 695 of file timeline-synchronizer.h.

### 10.58.2.2 segmenter\_ptr

```
using vxg::cloud::agent::synchronizer::segmenter_ptr = std::shared_ptr<segmenter>
```

Definition at line 74 of file timeline-synchronizer.h.

### 10.58.2.3 sync\_request\_ptr

```
using vxg::cloud::agent::synchronizer::sync_request_ptr = std::shared_ptr<sync_request>
```

Definition at line 79 of file timeline-synchronizer.h.

### 10.58.2.4 sync\_status\_report\_cb

```
using vxg::cloud::agent::synchronizer::sync_status_report_cb = std::function<void(int progress,  
sync_request_status status, std::shared_ptr<segmenter> seg)>
```

Definition at line 30 of file timeline-synchronizer.h.

## 10.58.3 Member Enumeration Documentation

### 10.58.3.1 sync\_request\_status

```
enum vxg::cloud::agent::synchronizer::sync_request_status [strong]
```

#### Enumerator

PENDING	
DONE	
ERROR	
CANCELED	

Definition at line 18 of file timeline-synchronizer.h.

## 10.58.4 Member Function Documentation

#### 10.58.4.1 create()

```
static ptr vxg::cloud::agent::synchronizer::create (
    const synchronizer::config & c,
    vxg::cloud::sync::timeline_ptr s,
    vxg::cloud::sync::timeline_ptr d ) [inline], [static]
```

Definition at line 697 of file timeline-synchronizer.h.

#### 10.58.4.2 start()

```
bool vxg::cloud::agent::synchronizer::start ( ) [inline]
```

Definition at line 713 of file timeline-synchronizer.h.

#### 10.58.4.3 stop()

```
void vxg::cloud::agent::synchronizer::stop ( ) [inline]
```

Definition at line 731 of file timeline-synchronizer.h.

#### 10.58.4.4 sync()

```
sync_request_ptr vxg::cloud::agent::synchronizer::sync (
    cloud::time begin,
    cloud::time end = utils::time::null(),
    sync_status_report_cb status_report_cb = nullptr,
    std::string upload_token = "",
    cloud::duration delay = std::chrono::microseconds(0) ) [inline]
```

Definition at line 759 of file timeline-synchronizer.h.

#### 10.58.4.5 sync\_cancel()

```
void vxg::cloud::agent::synchronizer::sync_cancel (
    const std::string & ticket ) [inline]
```

Definition at line 801 of file timeline-synchronizer.h.

#### 10.58.4.6 sync\_finalize()

```
void vxg::cloud::agent::synchronizer::sync_finalize (
    sync_request_ptr req,
    cloud::time end ) [inline]
```

Definition at line 797 of file timeline-synchronizer.h.

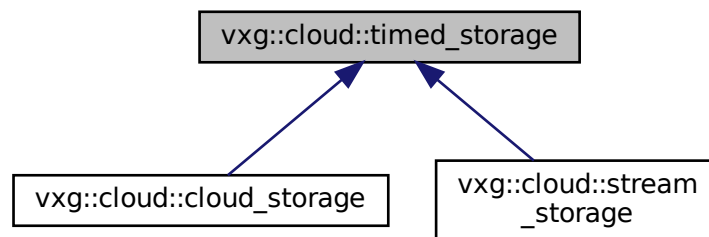
The documentation for this class was generated from the following file:

- [timeline-synchronizer.h](#)

### 10.59 vxg::cloud::timed\_storage Class Reference

```
#include <agent/timeline.h>
```

Inheritance diagram for vxg::cloud::timed\_storage:



#### Data Structures

- struct [item](#)

#### Public Types

- typedef **std::shared\_ptr**< struct [item](#) > [item\\_ptr](#)
- using [async\\_store\\_finished\\_cb](#) = **std::function**< void(bool)>
- using [async\\_store\\_is\\_canceled\\_cb](#) = **std::function**< bool(void)>

#### Public Member Functions

- [timed\\_storage](#) ()
- virtual [~timed\\_storage](#) ()
- virtual **std::vector**< [item\\_ptr](#) > [list](#) (cloud::time start, cloud::time stop)=0
- virtual bool [load](#) (item\_ptr)=0
- virtual bool [store](#) (item\_ptr)=0
- virtual bool [store\\_async](#) (item\_ptr, [async\\_store\\_finished\\_cb](#) finished\_cb, [async\\_store\\_is\\_canceled\\_cb](#) is\_canceled\_cb)
- virtual void [erase](#) (item\_ptr)=0
- virtual bool [init](#) ()
- virtual void [finit](#) ()

## 10.59.1 Detailed Description

Definition at line 67 of file timeline.h.

## 10.59.2 Member Typedef Documentation

### 10.59.2.1 async\_store\_finished\_cb

```
using vxg::cloud::timed_storage::async_store_finished_cb = std::function<void(bool)>
```

Definition at line 114 of file timeline.h.

### 10.59.2.2 async\_store\_is\_canceled\_cb

```
using vxg::cloud::timed_storage::async_store_is_canceled_cb = std::function<bool(void)>
```

Definition at line 115 of file timeline.h.

### 10.59.2.3 item\_ptr

```
typedef std::shared_ptr<struct item> vxg::cloud::timed_storage::item_ptr
```

Definition at line 108 of file timeline.h.

## 10.59.3 Constructor & Destructor Documentation

### 10.59.3.1 timed\_storage()

```
vxg::cloud::timed_storage::timed_storage ( ) [inline]
```

Definition at line 69 of file timeline.h.

### 10.59.3.2 ~timed\_storage()

```
virtual vxg::cloud::timed_storage::~~timed_storage ( ) [inline], [virtual]
```

Definition at line 70 of file timeline.h.

## 10.59.4 Member Function Documentation

### 10.59.4.1 erase()

```
virtual void vxg::cloud::timed_storage::erase (
    item_ptr ) [pure virtual]
```

Implemented in [vxg::cloud::cloud\\_storage](#), and [vxg::cloud::stream\\_storage](#).

### 10.59.4.2 finit()

```
virtual void vxg::cloud::timed_storage::finit ( ) [inline], [virtual]
```

Definition at line 125 of file timeline.h.

### 10.59.4.3 init()

```
virtual bool vxg::cloud::timed_storage::init ( ) [inline], [virtual]
```

Definition at line 124 of file timeline.h.

### 10.59.4.4 list()

```
virtual std::vector<item_ptr> vxg::cloud::timed_storage::list (
    cloud::time start,
    cloud::time stop ) [pure virtual]
```

Implemented in [vxg::cloud::cloud\\_storage](#), and [vxg::cloud::stream\\_storage](#).

### 10.59.4.5 load()

```
virtual bool vxg::cloud::timed_storage::load (
    item_ptr ) [pure virtual]
```

Implemented in [vxg::cloud::cloud\\_storage](#), and [vxg::cloud::stream\\_storage](#).

#### 10.59.4.6 store()

```
virtual bool vxg::cloud::timed_storage::store (
    item_ptr ) [pure virtual]
```

Implemented in [vxg::cloud::stream\\_storage](#), and [vxg::cloud::cloud\\_storage](#).

#### 10.59.4.7 store\_async()

```
virtual bool vxg::cloud::timed_storage::store_async (
    item_ptr ,
    async_store_finished_cb finished_cb,
    async_store_is_canceled_cb is_canceled_cb ) [inline], [virtual]
```

Reimplemented in [vxg::cloud::stream\\_storage](#).

Definition at line 116 of file [timeline.h](#).

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

- [timeline.h](#)

## 10.60 vxg::cloud::timeline< T > Class Template Reference

```
#include <agent/timeline.h>
```

### Public Member Functions

- [timeline](#) (const vxg::cloud::agent::proto::access\_token &access\_token, transport::libwebsockets::http::ptr http=nullptr)
- [timeline](#) ( std::string path)
- [std::vector< period > \\_squash\\_periods](#) ( [std::vector< timed\\_storage::item\\_ptr >](#) periods)
- [std::vector< period > slices](#) ( [cloud::time](#) start, [cloud::time](#) stop)

#### 10.60.1 Detailed Description

```
template<class T>
class vxg::cloud::timeline< T >
```

Definition at line 457 of file [timeline.h](#).

#### 10.60.2 Constructor & Destructor Documentation

**10.60.2.1 timeline() [1/2]**

```
template<class T >
vxg::cloud::timeline< T >::timeline (
    const vxg::cloud::agent::proto::access_token & access_token,
    transport::libwebsockets::http::ptr http = nullptr ) [inline]
```

Definition at line 461 of file timeline.h.

**10.60.2.2 timeline() [2/2]**

```
template<class T >
vxg::cloud::timeline< T >::timeline (
    std::string path ) [inline]
```

Definition at line 464 of file timeline.h.

**10.60.3 Member Function Documentation****10.60.3.1 \_squash\_periods()**

```
template<class T >
std::vector<period> vxg::cloud::timeline< T >::_squash_periods (
    std::vector< timed_storage::item_ptr > periods ) [inline]
```

Definition at line 466 of file timeline.h.

**10.60.3.2 slices()**

```
template<class T >
std::vector<period> vxg::cloud::timeline< T >::slices (
    cloud::time start,
    cloud::time stop ) [inline]
```

Definition at line 497 of file timeline.h.

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

- [timeline.h](#)

**10.61 vxg::cloud::sync::timeline Class Reference**

```
#include <agent/timeline.h>
```



## Public Types

- using `async_store_finished_cb` = `std::function< void(bool)>`
- using `async_store_is_canceled_cb` = `std::function< bool(void)>`

## Public Member Functions

- `timeline` (`timed_storage_ptr` storage)
- virtual `~timeline` ()
- `std::vector< period > _squash_periods` ( `std::vector< timed_storage::item_ptr >` periods)
- virtual bool `init` ()
- virtual void `finit` ()
- `std::vector< period > slices` (`cloud::time` start, `cloud::time` stop)
- `std::vector< timed_storage::item_ptr > list` (`cloud::time` start, `cloud::time` stop)
- bool `store` (`timed_storage::item_ptr` item)
- bool `load` (`timed_storage::item_ptr` item)
- virtual bool `store_async` (`timed_storage::item_ptr` item, `async_store_finished_cb` finished\_cb, `async_store_is_canceled_cb` is\_canceled\_cb)

### 10.61.1 Detailed Description

Definition at line 503 of file timeline.h.

### 10.61.2 Member Typedef Documentation

#### 10.61.2.1 `async_store_finished_cb`

```
using vxg::cloud::sync::timeline::async_store_finished_cb = std::function<void(bool)>
```

Definition at line 575 of file timeline.h.

#### 10.61.2.2 `async_store_is_canceled_cb`

```
using vxg::cloud::sync::timeline::async_store_is_canceled_cb = std::function<bool(void)>
```

Definition at line 576 of file timeline.h.

### 10.61.3 Constructor & Destructor Documentation

### 10.61.3.1 timeline()

```
vxg::cloud::sync::timeline::timeline (
    timed_storage_ptr storage ) [inline]
```

Definition at line 508 of file timeline.h.

### 10.61.3.2 ~timeline()

```
virtual vxg::cloud::sync::timeline::~~timeline ( ) [inline], [virtual]
```

Definition at line 509 of file timeline.h.

## 10.61.4 Member Function Documentation

### 10.61.4.1 \_squash\_periods()

```
std::vector<period> vxg::cloud::sync::timeline::_squash_periods (
    std::vector< timed_storage::item_ptr > periods ) [inline]
```

Definition at line 511 of file timeline.h.

### 10.61.4.2 finit()

```
virtual void vxg::cloud::sync::timeline::finit ( ) [inline], [virtual]
```

Definition at line 543 of file timeline.h.

### 10.61.4.3 init()

```
virtual bool vxg::cloud::sync::timeline::init ( ) [inline], [virtual]
```

Definition at line 541 of file timeline.h.

#### 10.61.4.4 list()

```
std::vector<timed_storage::item_ptr> vxg::cloud::sync::timeline::list (
    cloud::time start,
    cloud::time stop ) [inline]
```

Definition at line 550 of file timeline.h.

#### 10.61.4.5 load()

```
bool vxg::cloud::sync::timeline::load (
    timed_storage::item_ptr item ) [inline]
```

Definition at line 568 of file timeline.h.

#### 10.61.4.6 slices()

```
std::vector<period> vxg::cloud::sync::timeline::slices (
    cloud::time start,
    cloud::time stop ) [inline]
```

Definition at line 546 of file timeline.h.

#### 10.61.4.7 store()

```
bool vxg::cloud::sync::timeline::store (
    timed_storage::item_ptr item ) [inline]
```

Definition at line 561 of file timeline.h.

#### 10.61.4.8 store\_async()

```
virtual bool vxg::cloud::sync::timeline::store_async (
    timed_storage::item_ptr item,
    async_store_finished_cb finished_cb,
    async_store_is_canceled_cb is_canceled_cb ) [inline], [virtual]
```

Definition at line 577 of file timeline.h.

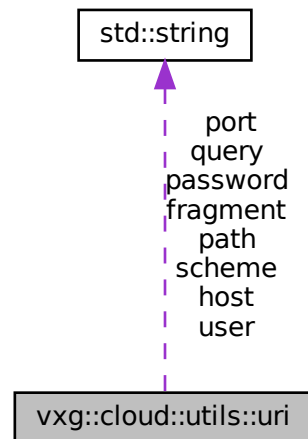
The documentation for this class was generated from the following file:

- [timeline.h](#)

## 10.62 vxg::cloud::utils::uri Struct Reference

```
#include <utils/utils.h>
```

Collaboration diagram for vxg::cloud::utils::uri:



### Static Public Member Functions

- static bool [parse](#) (const **std::string** &in\_uri, [uri](#) &result)

### Data Fields

- **std::string** [scheme](#)
- **std::string** [user](#)
- **std::string** [password](#)
- **std::string** [host](#)
- **std::string** [port](#)
- **std::string** [path](#)
- **std::string** [query](#)
- **std::string** [fragment](#)

### 10.62.1 Detailed Description

Definition at line 67 of file `utils.h`.

### 10.62.2 Member Function Documentation

### 10.62.2.1 parse()

```
static bool vxg::cloud::utils::uri::parse (
    const std::string & in_uri,
    uri & result ) [inline], [static]
```

Definition at line 77 of file utils.h.

## 10.62.3 Field Documentation

### 10.62.3.1 fragment

```
std::string vxg::cloud::utils::uri::fragment
```

Definition at line 75 of file utils.h.

### 10.62.3.2 host

```
std::string vxg::cloud::utils::uri::host
```

Definition at line 71 of file utils.h.

### 10.62.3.3 password

```
std::string vxg::cloud::utils::uri::password
```

Definition at line 70 of file utils.h.

### 10.62.3.4 path

```
std::string vxg::cloud::utils::uri::path
```

Definition at line 73 of file utils.h.

### 10.62.3.5 port

```
std::string vxg::cloud::utils::uri::port
```

Definition at line 72 of file utils.h.

### 10.62.3.6 query

```
std::string vxg::cloud::utils::uri::query
```

Definition at line 74 of file utils.h.

### 10.62.3.7 scheme

```
std::string vxg::cloud::utils::uri::scheme
```

Definition at line 68 of file utils.h.

### 10.62.3.8 user

```
std::string vxg::cloud::utils::uri::user
```

Definition at line 69 of file utils.h.

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

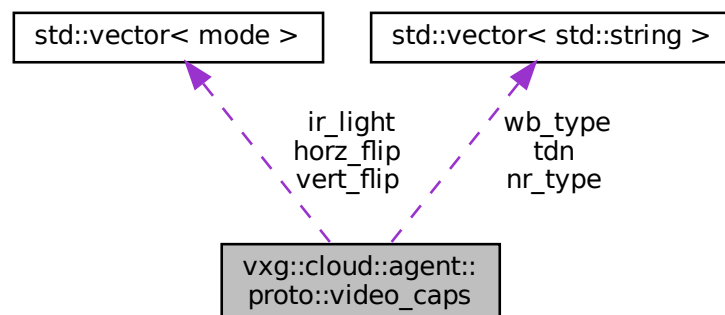
- [utils.h](#)

## 10.63 vxg::cloud::agent::proto::video\_caps Struct Reference

Video image capabilities.

```
#include <agent-proto/objects/caps.h>
```

Collaboration diagram for vxg::cloud::agent::proto::video\_caps:



## Data Fields

- **std::vector**< [mode](#) > [vert\\_flip](#)  
*vert\_flip: list of string, supported vertical flip modes, possible values ["off", "on", "auto"]*
- **std::vector**< [mode](#) > [horz\\_flip](#)  
*horz\_flip: list of string, supported horizontal flip modes, possible values ["off", "on", "auto"]*
- **std::vector**< **std::string** > [tdn](#)  
*tdn: list of string, supported TDM modes, possible values ["day", "night", "auto"]*
- **std::vector**< [mode](#) > [ir\\_light](#)  
*ir\_light: list of string, supported IR light modes, possible values ["off", "on", "auto"]*
- bool [brightness](#)  
*brightness: bool, True when camera supports brightness control*
- bool [contrast](#)  
*contrast: bool, True when camera supports contrast control*
- bool [saturation](#)  
*saturation: bool, True when camera supports saturation control*
- bool [sharpness](#)  
*sharpness: bool, True when camera supports sharpness control*
- **std::vector**< **std::string** > [nr\\_type](#)  
*nr\_type: list of string, supported noise reduce types.*
- bool [nr\\_level](#)  
*nr\_level: bool, True when noise reduce filter assumes control of NR level*
- **std::vector**< **std::string** > [wb\\_type](#)  
*wb\_type: list of string, supported white balance types.*
- bool [pwr\\_frequency](#)  
*pwr\_frequency: bool, True camera supports compensation of images flickering due to flashing of lamps in indoor environment*

### 10.63.1 Detailed Description

Video image capabilities.

Definition at line 366 of file caps.h.

### 10.63.2 Field Documentation

#### 10.63.2.1 [brightness](#)

```
bool vxg::cloud::agent::proto::video_caps::brightness
```

[brightness](#): bool, True when camera supports brightness control

Definition at line 384 of file caps.h.

### 10.63.2.2 contrast

```
bool vxg::cloud::agent::proto::video_caps::contrast
```

contrast: bool, True when camera supports contrast control

Definition at line 387 of file caps.h.

### 10.63.2.3 horz\_flip

```
std::vector<mode> vxg::cloud::agent::proto::video_caps::horz_flip
```

horz\_flip: list of string, supported horizontal flip modes, possible values ["off", "on", "auto"]

Definition at line 373 of file caps.h.

### 10.63.2.4 ir\_light

```
std::vector<mode> vxg::cloud::agent::proto::video_caps::ir_light
```

ir\_light: list of string, supported IR light modes, possible values ["off", "on", "auto"]

Definition at line 381 of file caps.h.

### 10.63.2.5 nr\_level

```
bool vxg::cloud::agent::proto::video_caps::nr_level
```

nr\_level: bool, True when noise reduce filter assumes control of NR level

Definition at line 402 of file caps.h.

### 10.63.2.6 nr\_type

```
std::vector< std::string> vxg::cloud::agent::proto::video_caps::nr_type
```

nr\_type: list of string, supported noise reduce types.

Empty list when camera doesn't support it. Example: ["off", "normal", "expert"]

Definition at line 398 of file caps.h.



### 10.63.2.7 pwr\_frequency

```
bool vxg::cloud::agent::proto::video_caps::pwr_frequency
```

pwr\_frequency: bool, True camera supports compensation of images flickering due to flashing of lamps in indoor environment

Definition at line 411 of file caps.h.

### 10.63.2.8 saturation

```
bool vxg::cloud::agent::proto::video_caps::saturation
```

saturation: bool, True when camera supports saturation control

Definition at line 390 of file caps.h.

### 10.63.2.9 sharpness

```
bool vxg::cloud::agent::proto::video_caps::sharpness
```

sharpness: bool, True when camera supports sharpness control

Definition at line 393 of file caps.h.

### 10.63.2.10 tdn

```
std::vector< std::string> vxg::cloud::agent::proto::video_caps::tdn
```

tdn: list of string, supported TDM modes, possible values ["day", "night", "auto"]

Definition at line 377 of file caps.h.

### 10.63.2.11 vert\_flip

```
std::vector<mode> vxg::cloud::agent::proto::video_caps::vert_flip
```

vert\_flip: list of string, supported vertical flip modes, possible values ["off", "on", "auto"]

Definition at line 369 of file caps.h.

### 10.63.2.12 wb\_type

```
std::vector< std::string> vxg::cloud::agent::proto::video_caps::wb_type
```

wb\_type: list of string, supported white balance types.

Empty list when camera doesn't support it. Example: ["auto", "3200K (Indor)", "4200K (Fluo)", "5600K (Outdoor)"]

Definition at line 407 of file caps.h.

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

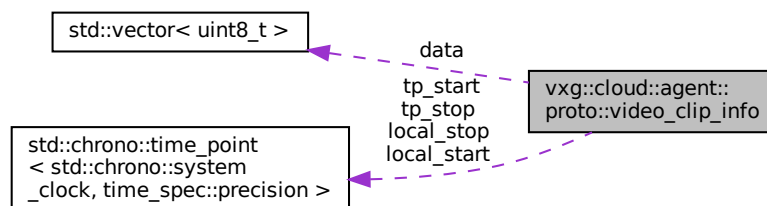
- [caps.h](#)

## 10.64 vxg::cloud::agent::proto::video\_clip\_info Struct Reference

Video recoding(mp4 file) clip description,.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::video\_clip\_info:



### Data Fields

- [cloud::time tp\\_start](#)  
*Clip start time UTC.*
- [cloud::time tp\\_stop](#)  
*Clip stop time UTC.*
- [cloud::time local\\_start](#)  
*Clip start time local.*
- [cloud::time local\\_stop](#)  
*Clip stop time local.*
- int [video\\_width](#)  
*Video clip picture width.*
- int [video\\_height](#)  
*Video clip picture height.*
- **std::vector< uint8\_t >** [data](#)  
*Video data buffer, we use move semantics internally so no data copying will be invoked.*

### 10.64.1 Detailed Description

Video recoding(mp4 file) clip description,.

Definition at line 449 of file config.h.

### 10.64.2 Field Documentation

#### 10.64.2.1 data

```
std::vector<uint8_t> vxg::cloud::agent::proto::video_clip_info::data
```

Video data buffer, we use move semantics internally so no data copying will be invoked.

Definition at line 475 of file config.h.

#### 10.64.2.2 local\_start

```
cloud::time vxg::cloud::agent::proto::video_clip_info::local_start
```

Clip start time local.

Definition at line 463 of file config.h.

#### 10.64.2.3 local\_stop

```
cloud::time vxg::cloud::agent::proto::video_clip_info::local_stop
```

Clip stop time local.

Definition at line 466 of file config.h.

#### 10.64.2.4 tp\_start

```
cloud::time vxg::cloud::agent::proto::video_clip_info::tp_start
```

Clip start time UTC.

Definition at line 458 of file config.h.

#### 10.64.2.5 tp\_stop

```
cloud::time vxg::cloud::agent::proto::video_clip_info::tp_stop
```

Clip stop time UTC.

Definition at line 460 of file config.h.

#### 10.64.2.6 video\_height

```
int vxg::cloud::agent::proto::video_clip_info::video_height
```

Video clip picture height.

Definition at line 471 of file config.h.

#### 10.64.2.7 video\_width

```
int vxg::cloud::agent::proto::video_clip_info::video_width
```

Video clip picture width.

Definition at line 469 of file config.h.

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

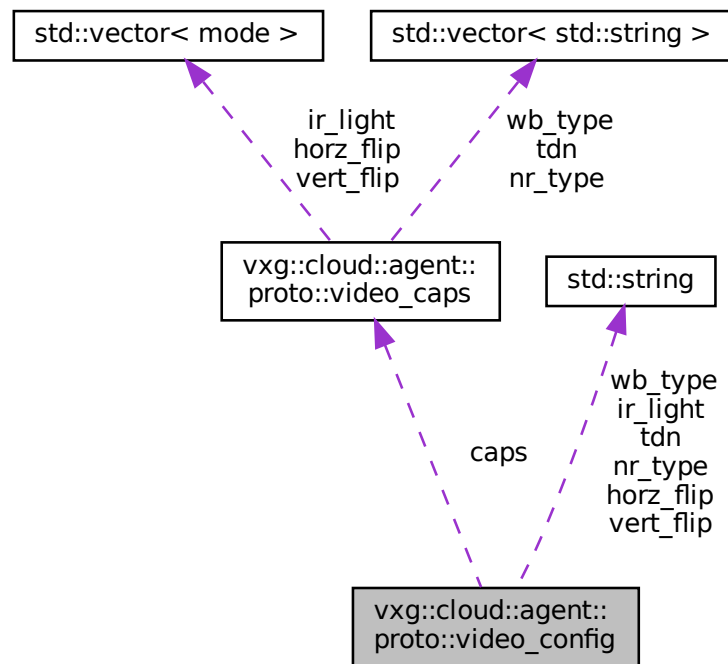
- [config.h](#)

### 10.65 vxg::cloud::agent::proto::video\_config Struct Reference

Video image config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::video\_config:



## Data Fields

- **std::string** [vert\\_flip](#)  
*vert\_flip: optional string, vertical image flip mode: ["off", "on", "auto"]*
- **std::string** [horz\\_flip](#)  
*horz\_flip: optional string, horizontal image flip mode: ["off", "on", "auto"]*
- **std::string** [tdn](#)  
*tdn: optional string, possible values ["day", "night", "auto"]*
- **std::string** [ir\\_light](#)  
*ir\_light: optional string, IR light for night conditions ["off", "on", "auto"]*
- **int** [brightness](#)  
*brightness: optional int, a brightness value from range 0-100 (%)*
- **int** [contrast](#)  
*contrast: optional int, a contrast value from range 0-100 (%)*
- **int** [saturation](#)  
*saturation: optional int, a saturation value from range 0-100 (%)*
- **int** [sharpness](#)  
*sharpness: optional int, a sharpness value from range 0-100 (%)*
- **std::string** [nr\\_type](#)  
*nr\_type: optional string, one of predefined noise reduce types from caps*
- **int** [nr\\_level](#)  
*nr\_level: optional int, level of noise reduce when filter requires it 0-100 (%)*
- **std::string** [wb\\_type](#)

- wb\_type*: optional string, one of predefined white balance types from caps
- int [pwr\\_frequency](#)  
*pwr\_frequency*: optional int, power line frequency [50, 60] (Hz)
- [video\\_caps](#) caps  
*caps*

### 10.65.1 Detailed Description

Video image config.

Definition at line 306 of file config.h.

### 10.65.2 Field Documentation

#### 10.65.2.1 brightness

```
int vxg::cloud::agent::proto::video_config::brightness
```

brightness: optional int, a brightness value from range 0-100 (%)

Definition at line 323 of file config.h.

#### 10.65.2.2 caps

```
video\_caps vxg::cloud::agent::proto::video_config::caps
```

caps

Definition at line 349 of file config.h.

#### 10.65.2.3 contrast

```
int vxg::cloud::agent::proto::video_config::contrast
```

contrast: optional int, a contrast value from range 0-100 (%)

Definition at line 326 of file config.h.

#### 10.65.2.4 horz\_flip

**std::string** vxg::cloud::agent::proto::video\_config::horz\_flip

horz\_flip: optional string, horizontal image flip mode: ["off", "on", "auto"]

Definition at line 313 of file config.h.

#### 10.65.2.5 ir\_light

**std::string** vxg::cloud::agent::proto::video\_config::ir\_light

ir\_light: optional string, IR light for night conditions ["off", "on", "auto"]

Definition at line 320 of file config.h.

#### 10.65.2.6 nr\_level

**int** vxg::cloud::agent::proto::video\_config::nr\_level

nr\_level: optional int, level of noise reduce when filter requires it 0-100 (%)

Definition at line 339 of file config.h.

#### 10.65.2.7 nr\_type

**std::string** vxg::cloud::agent::proto::video\_config::nr\_type

nr\_type: optional string, one of predefined noise reduce types from caps

Definition at line 335 of file config.h.

#### 10.65.2.8 pwr\_frequency

**int** vxg::cloud::agent::proto::video\_config::pwr\_frequency

pwr\_frequency: optional int, power line frequency [50, 60] (Hz)

Definition at line 346 of file config.h.

### 10.65.2.9 saturation

```
int vxg::cloud::agent::proto::video_config::saturation
```

saturation: optional int, a saturation value from range 0-100 (%)

Definition at line 329 of file config.h.

### 10.65.2.10 sharpness

```
int vxg::cloud::agent::proto::video_config::sharpness
```

sharpness: optional int, a sharpness value from range 0-100 (%)

Definition at line 332 of file config.h.

### 10.65.2.11 tdn

```
std::string vxg::cloud::agent::proto::video_config::tdn
```

tdn: optional string, possible values ["day", "night", "auto"]

Definition at line 316 of file config.h.

### 10.65.2.12 vert\_flip

```
std::string vxg::cloud::agent::proto::video_config::vert_flip
```

vert\_flip: optional string, vertical image flip mode: ["off", "on", "auto"]

Definition at line 309 of file config.h.

### 10.65.2.13 wb\_type

```
std::string vxg::cloud::agent::proto::video_config::wb_type
```

wb\_type: optional string, one of predefined white balance types from caps

Definition at line 343 of file config.h.

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

- [config.h](#)

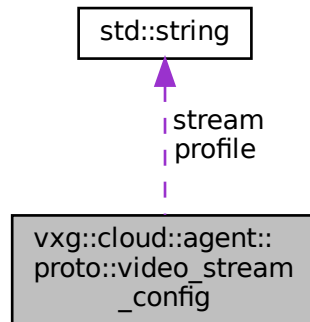


## 10.66 vxg::cloud::agent::proto::video\_stream\_config Struct Reference

Video stream config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::video\_stream\_config:



### Data Fields

- **std::string** `stream`  
Mandatory: video ES to use.
- **video\_format** `format`  
Mandatory: video encoding format.
- **std::string** `profile`  
Optional: profile that specifies format, when format assumes it.
- int `horz`  
Mandatory: int (horz) - video resolution width x height.
- int `vert`  
Mandatory: int (vert) - video resolution width x height.
- double `fps`  
Mandatory: framerate.
- bool `vbr`  
Mandatory: prefer VBR; if false or not set CBR should be used.
- int `gop`  
Mandatory: gop size (I-Frame interval);.
- int `brt`  
Optional: bitrate, kbps.
- int `vbr_brt`  
Optional: bitrate for VBR, kbps.
- int `quality`  
Optional: int [-4..4], quality profile hint for encoder, where 0 means normal.
- int `smoothing`  
Optional: a smoothing value from range 0-100 (%)

### 10.66.1 Detailed Description

Video stream config.

Definition at line 83 of file config.h.

### 10.66.2 Field Documentation

#### 10.66.2.1 brt

```
int vxg::cloud::agent::proto::video_stream_config::brt
```

Optional: bitrate, kbps.

Definition at line 117 of file config.h.

#### 10.66.2.2 format

```
video_format vxg::cloud::agent::proto::video_stream_config::format
```

Mandatory: video encoding format.

Definition at line 90 of file config.h.

#### 10.66.2.3 fps

```
double vxg::cloud::agent::proto::video_stream_config::fps
```

Mandatory: framerate.

Definition at line 105 of file config.h.

#### 10.66.2.4 gop

```
int vxg::cloud::agent::proto::video_stream_config::gop
```

Mandatory: gop size (I-Frame interval);.

Definition at line 113 of file config.h.

### 10.66.2.5 horz

```
int vxg::cloud::agent::proto::video_stream_config::horz
```

Mandatory: int (horz) - video resolution width x height.

Definition at line 98 of file config.h.

### 10.66.2.6 profile

```
std::string vxg::cloud::agent::proto::video_stream_config::profile
```

Optional: profile that specifies format, when format assumes it.

Definition at line 94 of file config.h.

### 10.66.2.7 quality

```
int vxg::cloud::agent::proto::video_stream_config::quality
```

Optional: int [-4..4], quality profile hint for encoder, where 0 means normal.

Definition at line 125 of file config.h.

### 10.66.2.8 smoothing

```
int vxg::cloud::agent::proto::video_stream_config::smoothing
```

Optional: a smoothing value from range 0-100 (%)

Definition at line 129 of file config.h.

### 10.66.2.9 stream

```
std::string vxg::cloud::agent::proto::video_stream_config::stream
```

Mandatory: video ES to use.

Definition at line 86 of file config.h.

**10.66.2.10 vbr**

```
bool vxg::cloud::agent::proto::video_stream_config::vbr
```

Mandatory: prefer VBR; if false or not set CBR should be used.

Definition at line 109 of file config.h.

**10.66.2.11 vbr\_brt**

```
int vxg::cloud::agent::proto::video_stream_config::vbr_brt
```

Optional: bitrate for VBR, kbps.

Definition at line 121 of file config.h.

**10.66.2.12 vert**

```
int vxg::cloud::agent::proto::video_stream_config::vert
```

Mandatory: int (vert) - video resolution width x height.

Definition at line 101 of file config.h.

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

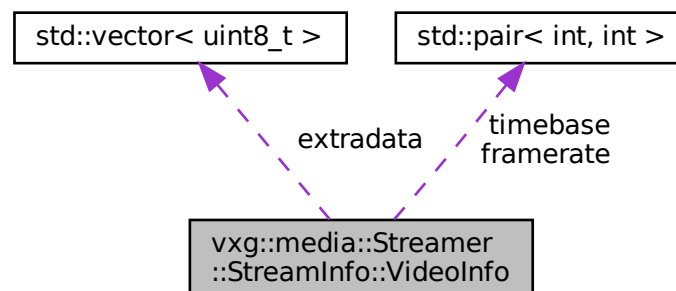
- [config.h](#)

**10.67 vxg::media::Streamer::StreamInfo::VideoInfo Struct Reference**

Video stream info.

```
#include <streamer/base_streamer.h>
```

Collaboration diagram for vxg::media::Streamer::StreamInfo::VideoInfo:



## Data Fields

- [VideoCodec codec](#)  
*Video codec type.*
- int [width](#)  
*Video width if needed.*
- int [height](#)  
*Video height if needed.*
- **std::pair**< int, int > [framerate](#)  
*Video framerate if needed.*
- int [bitrate](#)  
*Video bitrate if needed.*
- **std::pair**< int, int > [timebase](#)  
*Timescale of the timestamps, source fills it with timescale of timestamps source receives, [MediaFrame::pts](#) should use this timescale.*
- **std::vector**< uint8\_t > [extradata](#)  
*Can be AVC1 extradata or SPS/PPS, source fills it and sink should know and understand this format.*

### 10.67.1 Detailed Description

Video stream info.

This structure as well as [ISink::negotiate](#) method aimed to inform sink about streams source provides, if sink don't care the values of this structure may be ignored.

Definition at line 325 of file base\_streamer.h.

### 10.67.2 Field Documentation

#### 10.67.2.1 bitrate

```
int vxg::media::Streamer::StreamInfo::VideoInfo::bitrate
```

Video bitrate if needed.

Definition at line 335 of file base\_streamer.h.

#### 10.67.2.2 codec

```
VideoCodec vxg::media::Streamer::StreamInfo::VideoInfo::codec
```

Video codec type.

Definition at line 327 of file base\_streamer.h.

### 10.67.2.3 extradata

```
std::vector<uint8_t> vxg::media::Streamer::StreamInfo::VideoInfo::extradata
```

Can be AVC1 extradata or SPS/PPS, source fills it and sink should know and understand this format.

Definition at line 342 of file base\_streamer.h.

### 10.67.2.4 framerate

```
std::pair<int, int> vxg::media::Streamer::StreamInfo::VideoInfo::framerate
```

Video framerate if needed.

Definition at line 333 of file base\_streamer.h.

### 10.67.2.5 height

```
int vxg::media::Streamer::StreamInfo::VideoInfo::height
```

Video height if needed.

Definition at line 331 of file base\_streamer.h.

### 10.67.2.6 timebase

```
std::pair<int, int> vxg::media::Streamer::StreamInfo::VideoInfo::timebase
```

Timescale of the timestamps, source fills it with timescale of timestamps source receives, [MediaFrame::pts](#) should use this timescale.

Definition at line 339 of file base\_streamer.h.

### 10.67.2.7 width

```
int vxg::media::Streamer::StreamInfo::VideoInfo::width
```

Video width if needed.

Definition at line 329 of file base\_streamer.h.

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

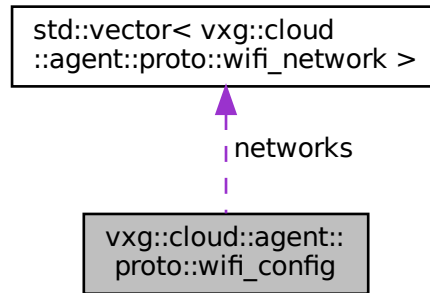
- [base\\_streamer.h](#)

## 10.68 vxg::cloud::agent::proto::wifi\_config Struct Reference

WiFi config.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::wifi\_config:



### Data Fields

- **std::vector< [wifi\\_network](#) > networks**  
List of [wifi\\_network](#) objects.

### 10.68.1 Detailed Description

WiFi config.

Definition at line 581 of file config.h.

### 10.68.2 Field Documentation

#### 10.68.2.1 networks

```
std::vector<wifi\_network> vxg::cloud::agent::proto::wifi_config::networks
```

List of [wifi\\_network](#) objects.

Definition at line 583 of file config.h.

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

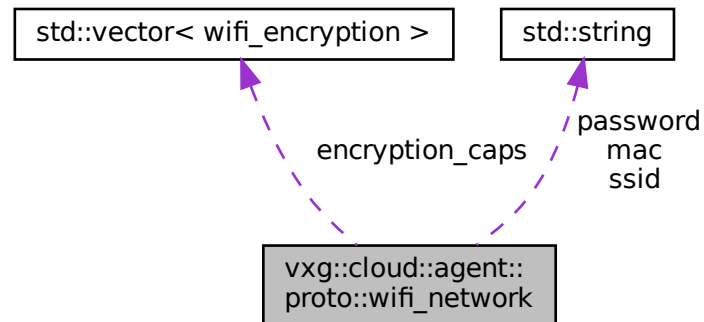
- [config.h](#)

## 10.69 vxg::cloud::agent::proto::wifi\_network Struct Reference

WiFi network object.

```
#include <agent-proto/objects/config.h>
```

Collaboration diagram for vxg::cloud::agent::proto::wifi\_network:



### Data Fields

- **std::string** [ssid](#)  
*ssid: string, network SSID*
- **int** [signal](#)  
*signal: int, signal strength, dB*
- **std::string** [mac](#)  
*mac: string, AP MAC address*
- **std::vector< [wifi\\_encryption](#) >** [encryption\\_caps](#)  
*encryption\_caps: list of string, supported encryption types,*
- [wifi\\_encryption](#) [encryption](#)  
*encryption: string, current encryption type, see encryption\_caps for possible values*
- **std::string** [password](#)  
*password: string, network password*

### 10.69.1 Detailed Description

WiFi network object.

Definition at line 552 of file config.h.

### 10.69.2 Field Documentation



### 10.69.2.1 encryption

`wifi_encryption vxg::cloud::agent::proto::wifi_network::encryption`

encryption: string, current encryption type, see encryption\_caps for possible values

Definition at line 563 of file config.h.

### 10.69.2.2 encryption\_caps

`std::vector<wifi_encryption> vxg::cloud::agent::proto::wifi_network::encryption_caps`

encryption\_caps: list of string, supported encryption types,

Definition at line 560 of file config.h.

### 10.69.2.3 mac

`std::string vxg::cloud::agent::proto::wifi_network::mac`

mac: string, AP MAC address

Definition at line 558 of file config.h.

### 10.69.2.4 password

`std::string vxg::cloud::agent::proto::wifi_network::password`

password: string, network password

Definition at line 565 of file config.h.

### 10.69.2.5 signal

`int vxg::cloud::agent::proto::wifi_network::signal`

signal: int, signal strength, dB

Definition at line 556 of file config.h.

### 10.69.2.6 ssid

`std::string vxg::cloud::agent::proto::wifi_network::ssid`

ssid: string, network SSID

Definition at line 554 of file config.h.

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

- [config.h](#)



## Chapter 11

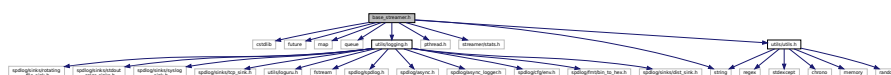
# File Documentation

### 11.1 app-dev.md File Reference

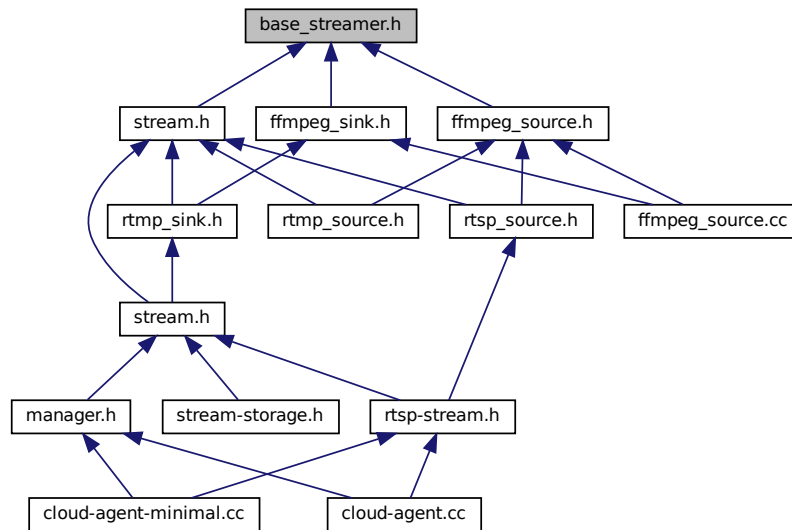
### 11.2 arm-example.txt File Reference

### 11.3 base\_streamer.h File Reference

```
#include <cstdlib>
#include <future>
#include <map>
#include <queue>
#include <string>
#include <pthread.h>
#include <streamer/stats.h>
#include <utils/logging.h>
#include <utils/utils.h>
Include dependency graph for base_streamer.h:
```



This graph shows which files directly or indirectly include this file:



## Data Structures

- struct [vxg::media::Streamer::StreamInfo](#)  
*Stream info description.*
- struct [vxg::media::Streamer::StreamInfo::VideoInfo](#)  
*Video stream info.*
- struct [vxg::media::Streamer::StreamInfo::AudioInfo](#)  
*Audio stream info.*
- struct [vxg::media::Streamer::MediaFrame](#)  
*Media frame container.*
- class [vxg::media::Streamer::ISink](#)
- class [vxg::media::Streamer::ISource](#)  
*ISource interface class.*

## Namespaces

- [vxg](#)
- [vxg::media](#)
- [vxg::media::Streamer](#)

## Macros

- `#define` [\\_\\_BASE\\_STREAMER\\_H](#)

## Typedefs

- using [vxg::media::Streamer::on\\_error\\_cb](#) = `std::function< void(Streamer::StreamError e)>`  
*On error callback, used for both [ISink](#) and [ISource](#) if was provided by user.*

## Enumerations

- enum `vsg::media::Streamer::DropDirection` { `vsg::media::Streamer::DROP_FRONT`, `vsg::media::Streamer::DROP_BACK` }
- enum `vsg::media::Streamer::StreamError` { `vsg::media::Streamer::E_NONE`, `vsg::media::Streamer::E_FATAL`, `vsg::media::Streamer::E_EOS` }  
*Stream error.*
- enum `vsg::media::Streamer::MediaType` { `vsg::media::Streamer::UNKNOWN`, `vsg::media::Streamer::VIDEO`, `vsg::media::Streamer::VIDEO_AVC_SPS`, `vsg::media::Streamer::VIDEO_AVC_PPS`, `vsg::media::Streamer::VIDEO_SEQ_HDR`, `vsg::media::Streamer::AUDIO`, `vsg::media::Streamer::AUDIO_SEQ_HDR`, `vsg::media::Streamer::FLV`, `vsg::media::Streamer::DATA`, `vsg::media::Streamer::MAX` }  
*Media frame type.*

## Variables

- constexpr int `vsg::media::Streamer::SINK_THREAD_PRIO`
- constexpr int `vsg::media::Streamer::SRC_THREAD_PRIO`

### 11.3.1 Macro Definition Documentation

#### 11.3.1.1 \_\_BASE\_STREAMER\_H

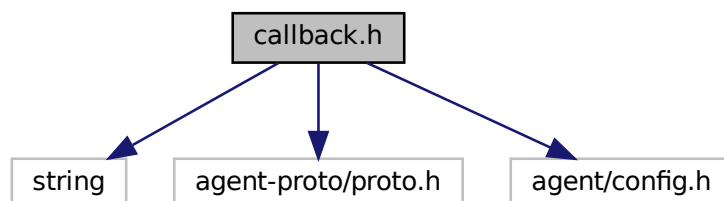
```
#define __BASE_STREAMER_H
```

Definition at line 14 of file `base_streamer.h`.

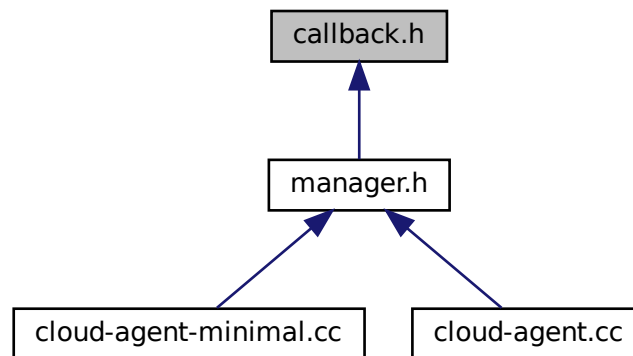
## 11.4 build-system.md File Reference

## 11.5 callback.h File Reference

```
#include <string>
#include <agent-proto/proto.h>
#include <agent/config.h>
Include dependency graph for callback.h:
```



This graph shows which files directly or indirectly include this file:



## Data Structures

- class `vxg::cloud::agent::callback`  
*VXG Cloud manager common callbacks class.*

## Namespaces

- `vxg`
- `vxg::cloud`
- `vxg::cloud::agent`  
*VXG Cloud Agent namespace.*

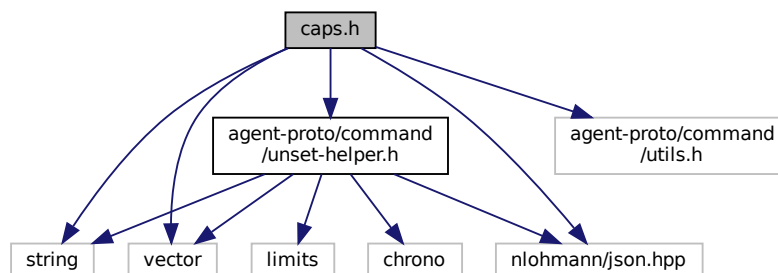
## 11.6 caps.h File Reference

```

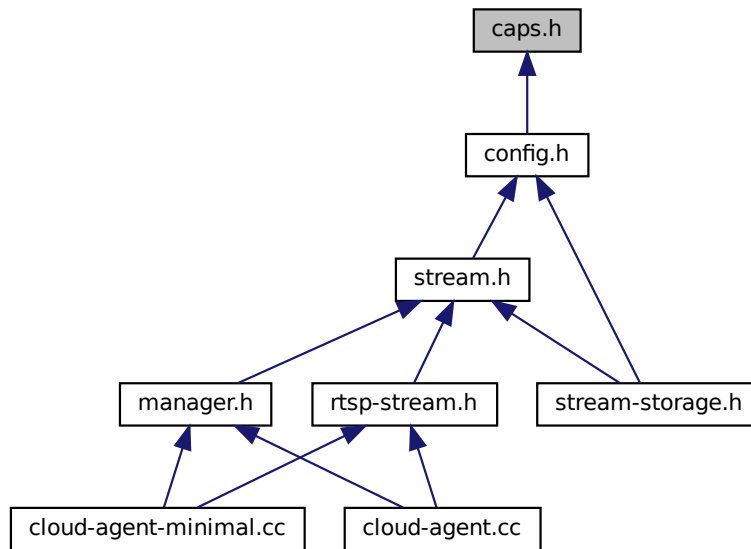
#include <string>
#include <vector>
#include <nlohmann/json.hpp>
#include <agent-proto/command/unset-helper.h>
#include <agent-proto/command/utls.h>

```

Include dependency graph for caps.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- struct [vxg::cloud::agent::proto::stream\\_caps](#)  
*Media stream capabilities.*
- struct [vxg::cloud::agent::proto::stream\\_caps::caps\\_video\\_object](#)  
*Video streams capabilities.*
- struct [vxg::cloud::agent::proto::stream\\_caps::caps\\_audio\\_object](#)  
*Audio streams capabilities.*
- struct [vxg::cloud::agent::proto::motion\\_detection\\_caps](#)  
*Motion detection capabilities camera capabilities that limit possible motion detection configuration.*
- struct [vxg::cloud::agent::proto::video\\_caps](#)  
*Video image capabilities.*
- struct [vxg::cloud::agent::proto::event\\_caps](#)  
*Events capabilities.*
- struct [vxg::cloud::agent::proto::audio\\_caps](#)  
*Audio capabilities.*
- struct [vxg::cloud::agent::proto::osd\\_caps](#)  
*OSD capabilities.*

## Namespaces

- [vxg](#)
- [vxg::cloud](#)
- [vxg::cloud::agent](#)  
*VXG Cloud Agent namespace.*
- [vxg::cloud::agent::proto](#)

## Macros

- `#define ignore_exception(...)`

## Typedefs

- using `json` = `nlohmann::json`

## Enumerations

- enum `vxg::cloud::agent::proto::mode` { `vxg::cloud::agent::proto::M_OFF`, `vxg::cloud::agent::proto::M_ON`, `vxg::cloud::agent::proto::M_AUTO`, `vxg::cloud::agent::proto::M_INVALID` }  
*Mode on/off.*
  - enum `vxg::cloud::agent::proto::video_format` { `vxg::cloud::agent::proto::VF_H264`, `vxg::cloud::agent::proto::VF_H265`, `vxg::cloud::agent::proto::VF_MJPEG`, `vxg::cloud::agent::proto::VF_INVALID` }  
*Video codec format.*
  - enum `vxg::cloud::agent::proto::audio_format` { `vxg::cloud::agent::proto::AF_G711A`, `vxg::cloud::agent::proto::AF_G711U`, `vxg::cloud::agent::proto::AF_RAW`, `vxg::cloud::agent::proto::AF_ADPCM`, `vxg::cloud::agent::proto::AF_MP3`, `vxg::cloud::agent::proto::AF_NELLY8`, `vxg::cloud::agent::proto::AF_NELLY16`, `vxg::cloud::agent::proto::AF_NELLY`, `vxg::cloud::agent::proto::AF_OPUS`, `vxg::cloud::agent::proto::AF_AAC`, `vxg::cloud::agent::proto::AF_SPEEX`, `vxg::cloud::agent::proto::AF_INVALID` }  
*Audio codec format.*
  - enum `vxg::cloud::agent::proto::audio_file_format` { `vxg::cloud::agent::proto::AFF_AU_G711U`, `vxg::cloud::agent::proto::AFF_MP3`, `vxg::cloud::agent::proto::AFF_WAV_PCM`, `vxg::cloud::agent::proto::AFF_INVALID` }  
*Audio file format.*
  - enum `vxg::cloud::agent::proto::motion_sensitivity` { `vxg::cloud::agent::proto::MS_REGION`, `vxg::cloud::agent::proto::MS_FRAME`, `vxg::cloud::agent::proto::MS_INVALID` }  
*Motion sensitivity.*
  - enum `vxg::cloud::agent::proto::motion_region_shape` { `vxg::cloud::agent::proto::MR_RECTANGLE`, `vxg::cloud::agent::proto::MR_ANY`, `vxg::cloud::agent::proto::MR_INVALID` }  
*Motion region shape.*
  - enum `vxg::cloud::agent::proto::ptz_action` { `vxg::cloud::agent::proto::A_LEFT`, `vxg::cloud::agent::proto::A_RIGHT`, `vxg::cloud::agent::proto::A_TOP`, `vxg::cloud::agent::proto::A_BOTTOM`, `vxg::cloud::agent::proto::A_ZOOM_IN`, `vxg::cloud::agent::proto::A_ZOOM_OUT`, `vxg::cloud::agent::proto::A_STOP`, `vxg::cloud::agent::proto::A_INVALID` }  
*PTZ actions.*
  - enum `vxg::cloud::agent::proto::ptz_preset_action` { `vxg::cloud::agent::proto::PA_CREATE`, `vxg::cloud::agent::proto::PA_DELETE`, `vxg::cloud::agent::proto::PA_GOTO`, `vxg::cloud::agent::proto::PA_UPDATE`, `vxg::cloud::agent::proto::PA_INVALID` }  
*PTZ preset action.*
  - enum `vxg::cloud::agent::proto::time_format_n` { `vxg::cloud::agent::proto::TF_12H`, `vxg::cloud::agent::proto::TF_24H`, `vxg::cloud::agent::proto::TF_INVALID` }
- 3.34 `get_osd_conf` (SRV) 3.35 `osd_conf` (CM) 3.36 `set_osd_conf` (SRV)

### 11.6.1 Macro Definition Documentation



### 11.6.1.1 ignore\_exception

```
#define ignore_exception(
    ... )
```

Definition at line 20 of file caps.h.

## 11.6.2 Typedef Documentation

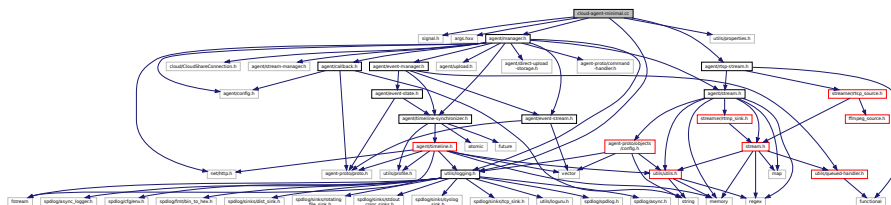
### 11.6.2.1 json

```
using json = nlohmann::json
```

Definition at line 12 of file caps.h.

## 11.7 cloud-agent-minimal.cc File Reference

```
#include <signal.h>
#include <args.hxx>
#include <agent/manager.h>
#include <agent/rtsp-stream.h>
#include <utils/logging.h>
#include <utils/properties.h>
Include dependency graph for cloud-agent-minimal.cc:
```



## Functions

- static void [signal\\_handler](#) (int sig)
- bool [parse\\_args](#) (int argc, char \*\*argv)
- int [main](#) (int argc, char \*\*argv)

## Variables

- agent::config [agent\\_config](#)  
[Includes and namespaces]
- static bool [quit](#)
- static vxg::properties [props](#)
- std::string [vxg\\_cloud\\_token](#)  
[Minimal callback class implementation]
- std::string [rtsp\\_url](#)

## 11.7.1 Function Documentation

### 11.7.1.1 `main()`

```
int main (  
    int argc,  
    char ** argv )
```

[Create and start agent object]

[Create and start agent object]

[Stop agent]

[Stop agent]

Definition at line 87 of file cloud-agent-minimal.cc.

### 11.7.1.2 `parse_args()`

```
bool parse_args (  
    int argc,  
    char ** argv )
```

Definition at line 48 of file cloud-agent-minimal.cc.

### 11.7.1.3 `signal_handler()`

```
static void signal_handler (  
    int sig ) [static]
```

Definition at line 20 of file cloud-agent-minimal.cc.

## 11.7.2 Variable Documentation

### 11.7.2.1 `agent_config`

```
agent::config agent_config
```

[Includes and namespaces]

Definition at line 15 of file cloud-agent-minimal.cc.



## Functions

- static void [signal\\_handler](#) (int sig)
- bool [parse\\_args](#) (int argc, char \*\*argv)
- int [main](#) (int argc, char \*\*argv)

## Variables

- agent::config [agent\\_config](#)  
*[Includes and namespaces]*
- static bool [quit](#)
- **std::string** [vxg\\_cloud\\_token](#)  
*[Event stream callback class implementation]*
- **std::string** [rtsp\\_url](#)

### 11.8.1 Function Documentation

#### 11.8.1.1 main()

```
int main (
    int argc,
    char ** argv )
```

[Create and start agent object]

[Create and start agent object]

[Stop agent]

[Stop agent]

Definition at line 349 of file cloud-agent.cc.

#### 11.8.1.2 parse\_args()

```
bool parse_args (
    int argc,
    char ** argv )
```

Definition at line 317 of file cloud-agent.cc.

### 11.8.1.3 signal\_handler()

```
static void signal_handler (  
    int sig ) [static]
```

Definition at line 18 of file cloud-agent.cc.

## 11.8.2 Variable Documentation

### 11.8.2.1 agent\_config

```
agent::config agent_config
```

[Includes and namespaces]

Definition at line 14 of file cloud-agent.cc.

### 11.8.2.2 quit

```
bool quit [static]
```

Definition at line 15 of file cloud-agent.cc.

### 11.8.2.3 rtsp\_url

```
std::string rtsp_url
```

Definition at line 315 of file cloud-agent.cc.

### 11.8.2.4 vxg\_cloud\_token

```
std::string vxg_cloud_token
```

[Event stream callback class implementation]

Definition at line 314 of file cloud-agent.cc.

## 11.9 compile.md File Reference

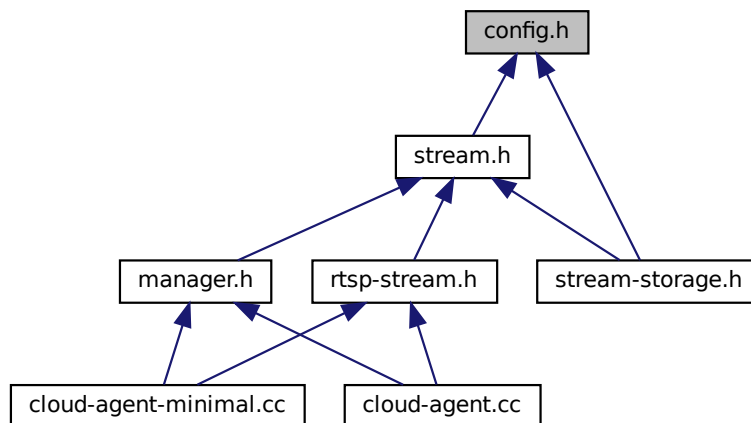
### 11.10 config.h File Reference

```
#include <iostream>
#include <string>
#include <vector>
#include <vxgcloudagent-config.h>
#include <nlohmann/json.hpp>
#include <agent-proto/command/unset-helper.h>
#include <agent-proto/command/utils.h>
#include <agent-proto/objects/caps.h>
#include <utils/base64.h>
#include <utils/logging.h>
#include <utils/utils.h>
```

Include dependency graph for config.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- struct [vxg::cloud::agent::proto::video\\_stream\\_config](#)  
*Video stream config.*
- struct [vxg::cloud::agent::proto::audio\\_stream\\_config](#)  
*Audio media stream config.*
- struct [vxg::cloud::agent::proto::stream\\_config](#)

- *Media stream config.*
- struct [vxg::cloud::agent::proto::motion\\_region](#)
- *Motion detection related structs.*
- struct [vxg::cloud::agent::proto::motion\\_detection\\_config](#)
- *Motion detection config.*
- struct [vxg::cloud::agent::proto::video\\_config](#)
- *Video image config.*
- struct [vxg::cloud::agent::proto::video\\_clip\\_info](#)
- *Video recoding(mp4 file) clip description,.*
- struct [vxg::cloud::agent::proto::wifi\\_network](#)
- *WiFi network object.*
- struct [vxg::cloud::agent::proto::wifi\\_config](#)
- *WiFi config.*
- struct [vxg::cloud::agent::event\\_config](#)
- *Event config.*
- struct [vxg::cloud::agent::events\\_config](#)
- *Events config, list of [event\\_config](#) objects.*
- struct [vxg::cloud::agent::audio\\_config](#)
- *Audio config.*
- struct [vxg::cloud::agent::ptz\\_preset](#)
- *PTZ preset.*
- struct [vxg::cloud::agent::ptz\\_config](#)
- *PTZ config.*
- struct [vxg::cloud::agent::ptz\\_command](#)
- *PTZ command.*
- struct [vxg::cloud::agent::osd\\_config](#)
- *OSD config.*
- struct [vxg::cloud::agent::access\\_token](#)
- *VXG Cloud access token.*
- struct [vxg::cloud::agent::access\\_token::proxy\\_config](#)
- *Socks proxy settings.*
- struct [vxg::cloud::agent::supported\\_stream\\_config](#)
- *Supported stream config.*
- struct [vxg::cloud::agent::supported\\_streams\\_config](#)
- *Supported streams config, list of [supported\\_stream\\_config](#).*
- struct [vxg::cloud::agent::audio\\_detection\\_config](#)
- *5.6 [audio\\_detection\\_config](#) (CM) Current audio detection settings.*
- struct [vxg::cloud::agent::audio\\_detection\\_config::audio\\_detection\\_conf\\_caps](#)

## Namespaces

- [vxg](#)
- [vxg::cloud](#)
- [vxg::cloud::time\\_spec](#)
- *time point*
- [nlohmann](#)
- [vxg::cloud::agent](#)
- *VXG Cloud Agent namespace.*
- [vxg::cloud::agent::proto](#)

## Typedefs

- using `vxg::cloud::time_spec::precision` = `std::chrono::microseconds`
- template<typename T >  
using `vxg::cloud::time_spec::duration` = typename `std::conditional< std::is_same< T, precision >::value, precision, std::chrono::duration< T > >::type`
- using `vxg::cloud::time` = `std::chrono::time_point< std::chrono::system_clock, time_spec::precision >`
- using `vxg::cloud::duration` = `time_spec::duration< time_spec::precision >`
- typedef `wifi_config vxg::cloud::agent::proto::wifi_list`  
*wifi\_config*

## Enumerations

- enum `vxg::cloud::agent::proto::event_status` { `vxg::cloud::agent::proto::ES_OK`, `vxg::cloud::agent::proto::ES_ERROR`, `vxg::cloud::agent::proto::ES_INVALID` }  
*Event status.*
- enum `vxg::cloud::agent::proto::event_type` {  
`vxg::cloud::agent::proto::ET_MOTION`, `vxg::cloud::agent::proto::ET_SOUND`, `vxg::cloud::agent::proto::ET_NET`,  
`vxg::cloud::agent::proto::ET_RECORD`,  
`vxg::cloud::agent::proto::ET_MEMORYCARD`, `vxg::cloud::agent::proto::ET_WIFI`, `vxg::cloud::agent::proto::ET_CUSTOM`,  
`vxg::cloud::agent::proto::ET_INVALID` }  
*Types of events.*
- enum `vxg::cloud::agent::proto::memorycard_status` {  
`vxg::cloud::agent::proto::MCS_NONE`, `vxg::cloud::agent::proto::MCS_NORMAL`, `vxg::cloud::agent::proto::MCS_NEED_FORM`,  
`vxg::cloud::agent::proto::MCS_FORMATTING`,  
`vxg::cloud::agent::proto::MCS_INITIALIZATION`, `vxg::cloud::agent::proto::MCS_INVALID` }  
*Memory card status.*
- enum `vxg::cloud::agent::proto::wifi_encryption` {  
`vxg::cloud::agent::proto::WFE_OPEN`, `vxg::cloud::agent::proto::WFE_WEP`, `vxg::cloud::agent::proto::WFE_WPA`,  
`vxg::cloud::agent::proto::WFE_WPA2`,  
`vxg::cloud::agent::proto::WFE_WPA_ENTERPRISE`, `vxg::cloud::agent::proto::WFE_WPA2_ENTERPRISE`,  
`vxg::cloud::agent::proto::WFE_INVALID` }  
*WiFi encryption type.*
- enum `vxg::cloud::agent::proto::wifi_network_state` {  
`vxg::cloud::agent::proto::WNS_UNKNOWN`, `vxg::cloud::agent::proto::WNS_INITIALIZE_0`, `vxg::cloud::agent::proto::WNS_INIT`,  
`vxg::cloud::agent::proto::WNS_TRY_CONNECT`,  
`vxg::cloud::agent::proto::WNS_RECEIVING_IP`, `vxg::cloud::agent::proto::WNS_CONNECTED`, `vxg::cloud::agent::proto::WNS_`  
}  
*WiFi connection state.*

## Functions

- `std::string vxg::cloud::agent::proto::name () const`

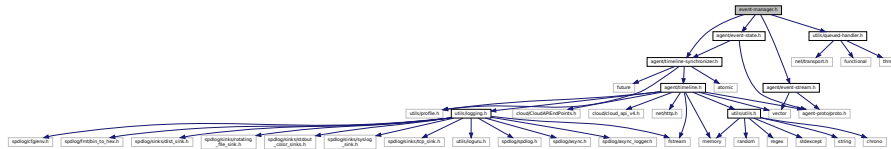
### 11.10.1 Detailed Description

VXG Cloud CM protocol objects

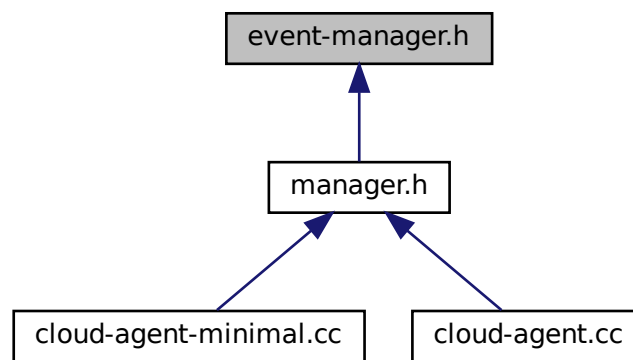


## 11.11 event-manager.h File Reference

```
#include <agent/event-state.h>
#include <agent/event-stream.h>
#include <agent/timeline-synchronizer.h>
#include <utils/queued-handler.h>
Include dependency graph for event-manager.h:
```



This graph shows which files directly or indirectly include this file:



### Data Structures

- class [vxg::cloud::agent::event\\_manager](#)
- struct [vxg::cloud::agent::event\\_manager::config](#)
- struct [vxg::cloud::agent::event\\_manager::event\\_state\\_report\\_cb](#)

### Namespaces

- [vxg](#)
- [vxg::cloud](#)
- [vxg::cloud::agent](#)

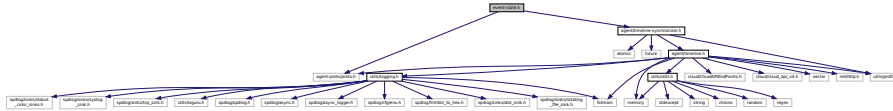
*VXG Cloud Agent namespace.*

### Typedefs

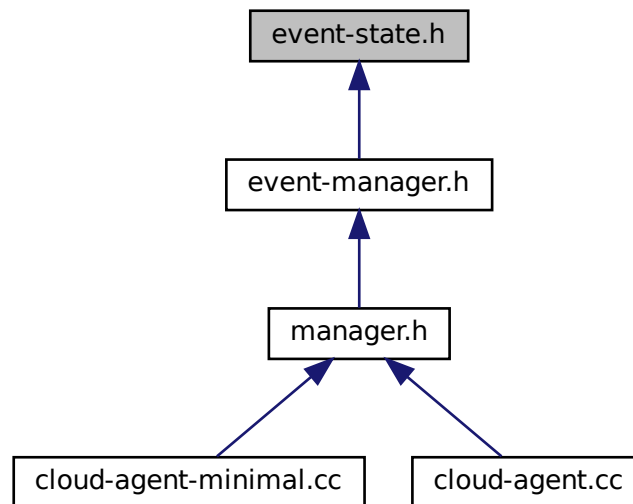
- using [vxg::cloud::agent::event\\_manager\\_ptr](#) = `std::shared_ptr< event_manager >`

## 11.12 event-state.h File Reference

```
#include <agent-proto/proto.h>
#include <agent/timeline-synchronizer.h>
Include dependency graph for event-state.h:
```



This graph shows which files directly or indirectly include this file:



### Data Structures

- class [vxg::cloud::agent::event\\_state](#)
- struct [vxg::cloud::agent::event\\_state::event\\_state\\_changed\\_cb](#)

### Namespaces

- [vxg](#)
- [vxg::cloud](#)
- [vxg::cloud::agent](#)

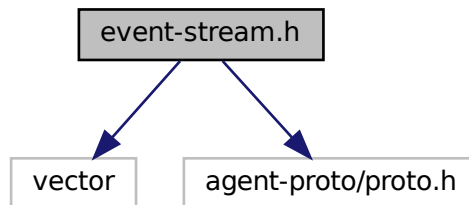
*VXG Cloud Agent namespace.*

### Typedefs

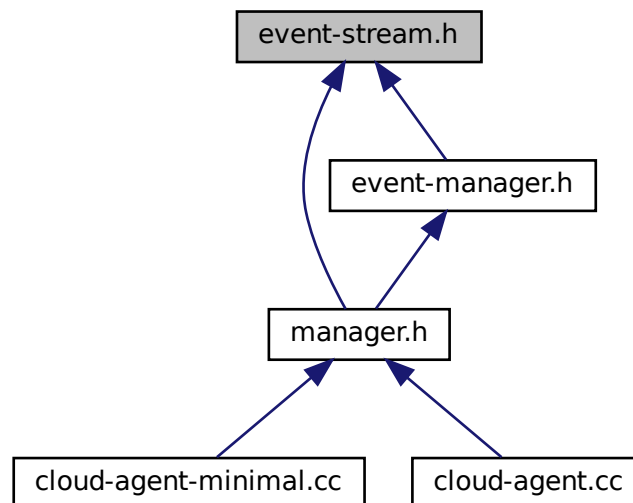
- using [vxg::cloud::agent::event\\_state\\_ptr](#) = `std::shared_ptr< event_state >`

## 11.13 event-stream.h File Reference

```
#include <vector>
#include <agent-proto/proto.h>
Include dependency graph for event-stream.h:
```



This graph shows which files directly or indirectly include this file:



## Data Structures

- class [vxg::cloud::agent::event\\_stream](#)  
*Event stream, abstract class for event generation.*

## Namespaces

- [vsg](#)
- [vsg::cloud](#)
- [vsg::cloud::agent](#)

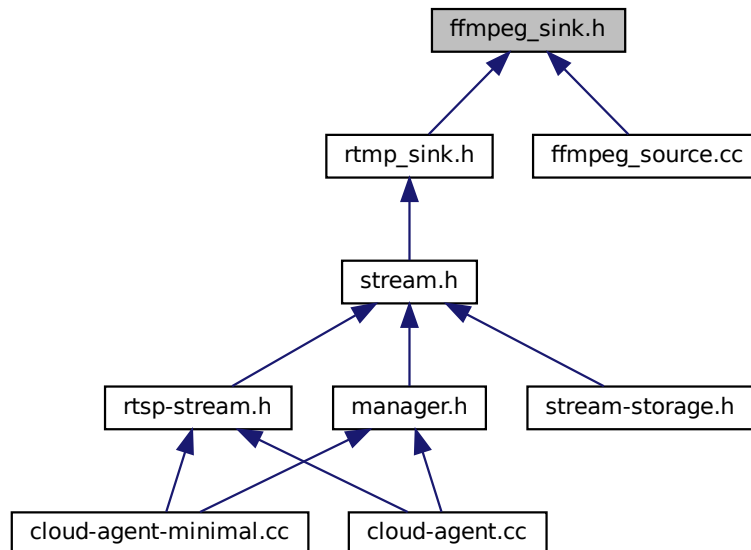
*VXG Cloud Agent namespace.*

## 11.14 ffmpeg\_sink.h File Reference

```
#include "base_streamer.h"
#include "ffmpeg_common.h"
Include dependency graph for ffmpeg_sink.h:
```



This graph shows which files directly or indirectly include this file:



## Data Structures

- class [vsg::media::ffmpeg::Sink](#)  
*Base ffmpeg sink class.*

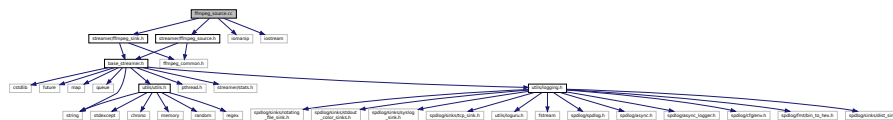
## Namespaces

- vxg
- vxg::media
- vxg::media::ffmpeg

## 11.15 ffmpeg\_source.cc File Reference

```
#include <streamer/ffmpeg_sink.h>
#include <streamer/ffmpeg_source.h>
#include <iomanip>
#include <iostream>
```

Include dependency graph for ffmpeg\_source.cc:



## Namespaces

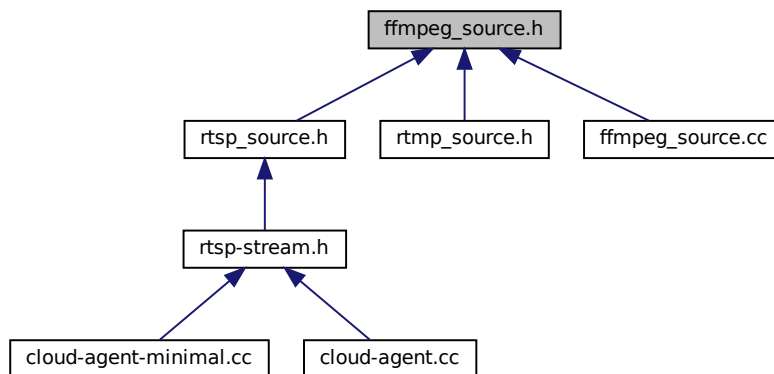
- vxg
- vxg::media

## 11.16 ffmpeg\_source.h File Reference

```
#include "base_streamer.h"
#include "ffmpeg_common.h"
Include dependency graph for ffmpeg_source.h:
```



This graph shows which files directly or indirectly include this file:



## Data Structures

- class `vvg::media::ffmpeg::Source`  
Base *ffmpeg* source class.

## Namespaces

- `vvg`
- `vvg::media`
- `vvg::media::ffmpeg`

## 11.17 logging.h File Reference

```

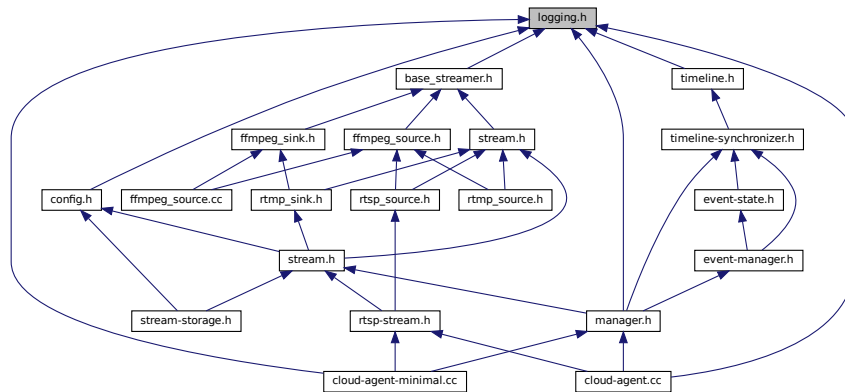
#include <spdlog/spdlog.h>
#include <spdlog/async.h>
#include <spdlog/async_logger.h>
#include <spdlog/cfg/env.h>
#include <spdlog/fmt/bin_to_hex.h>
#include <spdlog/sinks/dist_sink.h>
#include <spdlog/sinks/rotating_file_sink.h>
#include <spdlog/sinks/stdout_color_sinks.h>
#include <spdlog/sinks/syslog_sink.h>
#include <spdlog/sinks/tcp_sink.h>
#include <utils/loguru.h>
#include <fstream>

```

Include dependency graph for `logging.h`:



This graph shows which files directly or indirectly include this file:



## Data Structures

- class `vxg::logger`  
*Logger class, current implementation based on spdlog.*
- struct `vxg::logger::options`

## Namespaces

- `vxg`

## 11.18 mainpage.md File Reference

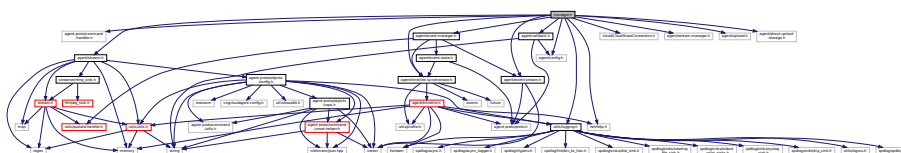
## 11.19 manager.h File Reference

```

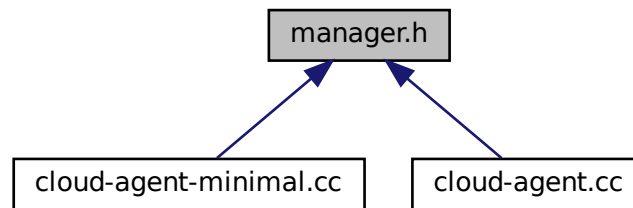
#include <agent-proto/command-handler.h>
#include <agent/callback.h>
#include <agent/config.h>
#include <agent/event-stream.h>
#include <cloud/CloudShareConnection.h>
#include <agent/stream-manager.h>
#include <agent/stream.h>
#include <agent/upload.h>
#include <net/http.h>
#include <utils/logging.h>
#include <agent/direct-upload-storage.h>
#include <agent/event-manager.h>
#include <agent/timeline-synchronizer.h>

```

Include dependency graph for manager.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- class `vsg::cloud::agent::manager`  
*VXG Cloud agent manager class.*

## Namespaces

- `vsg`
- `vsg::cloud`
- `vsg::cloud::agent`  
*VXG Cloud Agent namespace.*

## Functions

- `std::string vsg::cloud::agent::version ()`  
*VXG Cloud Agent library version.*

## 11.20 meson.build File Reference

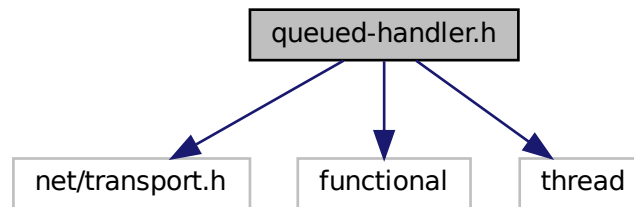
### 11.21 queued-handler.h File Reference

```
#include <net/transport.h>
#include <functional>
```

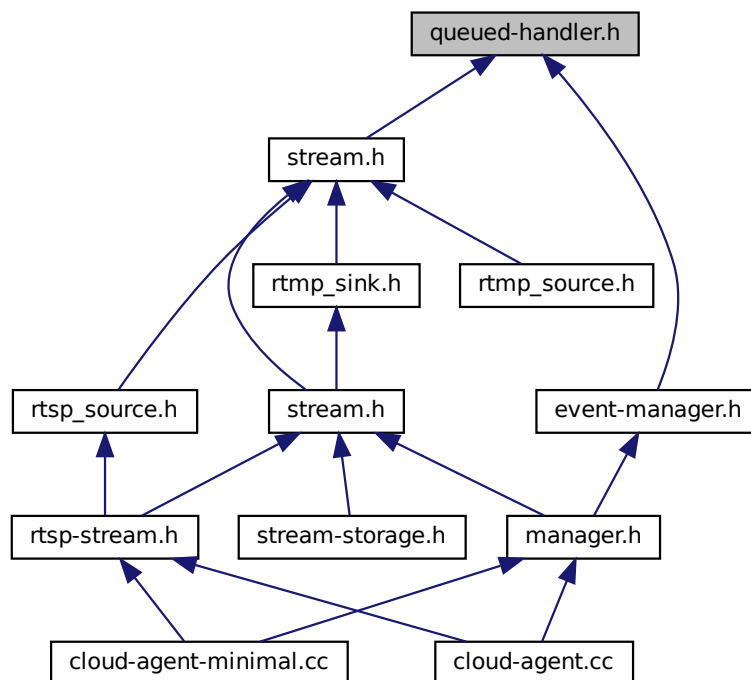


```
#include <thread>
```

Include dependency graph for queued-handler.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- class [vsg::cloud::utils::queued\\_async\\_handler< T >](#)

## Namespaces

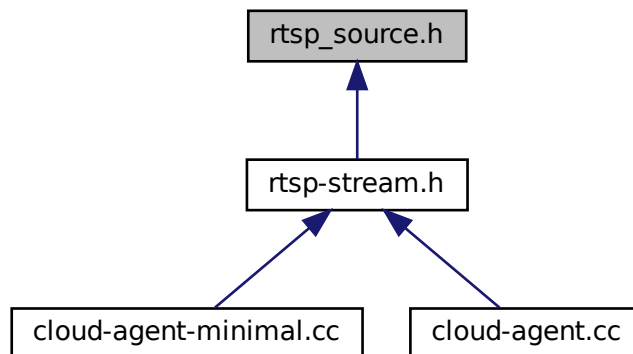
- [vsg](#)
- [vsg::cloud](#)
- [vsg::cloud::utils](#)







This graph shows which files directly or indirectly include this file:



## Data Structures

- class `vxg::media::rtsp_source`  
*RTSP source class.*

## Namespaces

- `vxg`
- `vxg::media`

### 11.25.1 Detailed Description

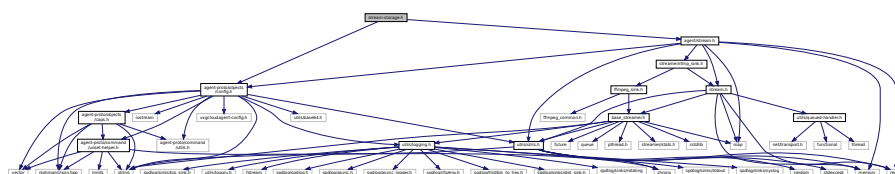
RTSP source

## 11.26 stream-storage.h File Reference

```
#include <agent-proto/objects/config.h>
```

```
#include <agent/stream.h>
```

Include dependency graph for `stream-storage.h`:



## Data Structures

- class [vvg::cloud::stream\\_storage](#)

## Namespaces

- [vvg](#)
- [vvg::cloud](#)

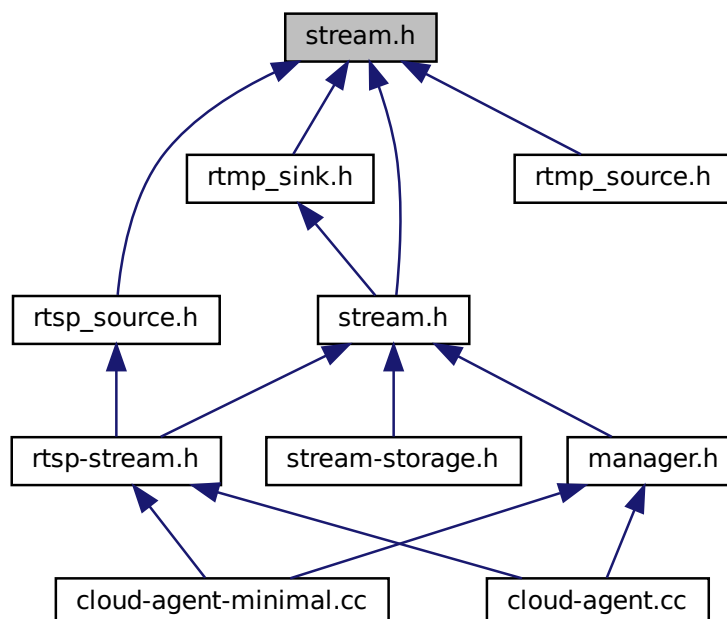
## 11.27 stream.h File Reference

```
#include <map>
#include <memory>
#include <regex>
#include <streamer/base_streamer.h>
#include <utils/queued-handler.h>
#include <utils/utils.h>
```

Include dependency graph for streamer/stream.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- class [vsg::media::stream](#)  
*base media stream abstract class*

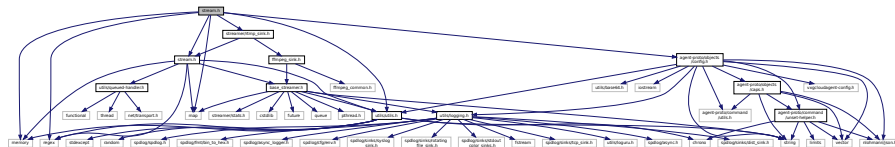
## Namespaces

- [vsg](#)
- [vsg::media](#)

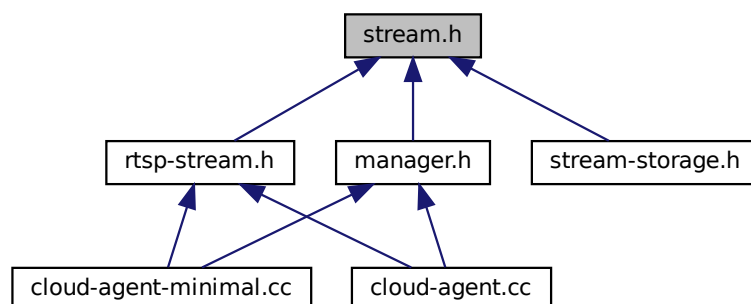
## 11.28 stream.h File Reference

```
#include <map>
#include <memory>
#include <regex>
#include <agent-proto/objects/config.h>
#include <streamer/rtmp_sink.h>
#include <streamer/stream.h>
#include <utils/utils.h>
```

Include dependency graph for agent/stream.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- class [vsg::cloud::agent::media::stream](#)  
*Cloud agent media stream abstract class.*





## Data Structures

- class vxg::cloud::agent::synchronizer
- struct vxg::cloud::agent::synchronizer::config
- struct vxg::cloud::agent::synchronizer::segmenter
- struct vxg::cloud::agent::synchronizer::sync\_request

## Namespaces

- vxg
- vxg::cloud
- vxg::cloud::agent

*VXG Cloud Agent namespace.*

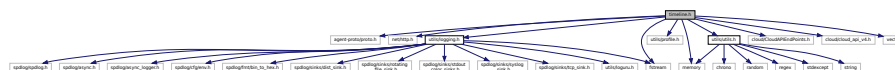
## Typedefs

- using `vxx::cloud::agent::synchronizer_ptr = std::shared_ptr< synchronizer >`

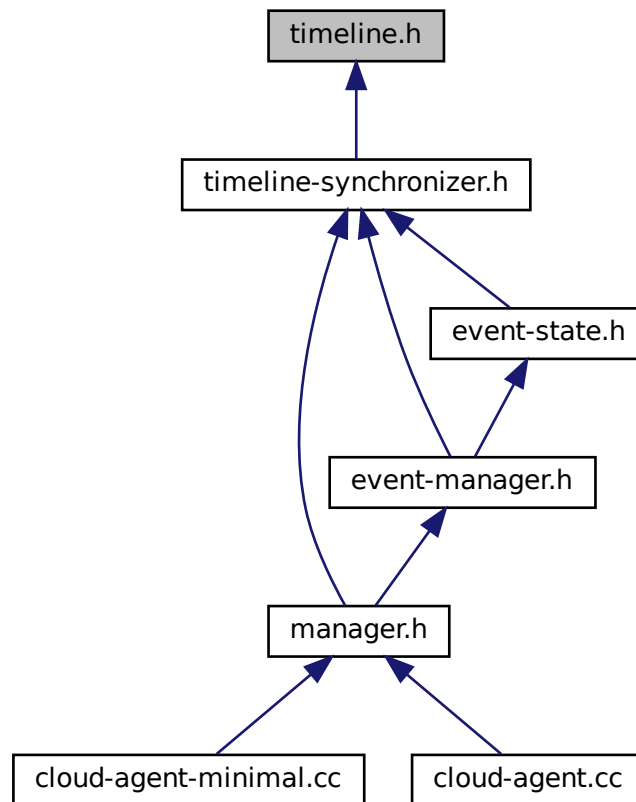
### 11.30 timeline.h File Reference

```
#include <agent-proto/proto.h>
#include <net/http.h>
#include <utils/logging.h>
#include <utils/profile.h>
#include <utils/utils.h>
#include <cloud/CloudAPIEndpoints.h>
#include <cloud/cloud_api_v4.h>
#include <fstream>
#include <memory>
#include <vector>
```

Include dependency graph for timeline.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- struct [vxg::cloud::period](#)
- class [vxg::cloud::timed\\_storage](#)
- struct [vxg::cloud::timed\\_storage::item](#)
- class [vxg::cloud::cloud\\_storage](#)
- class [vxg::cloud::timeline< T >](#)
- class [vxg::cloud::sync::timeline](#)

## Namespaces

- [vxg](#)
- [vxg::cloud](#)
- [vxg::cloud::sync](#)

## Typedefs

- typedef `std::shared_ptr< timed\_storage >` [vxg::cloud::timed\\_storage\\_ptr](#)
- using [vxg::cloud::sync::timeline\\_ptr](#) = `std::shared_ptr< timeline >`

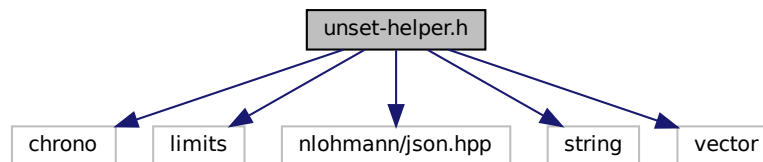
## Functions

- bool `vxg::cloud::operator<` (const `timed_storage::item_ptr` l, const `timed_storage::item_ptr` r)

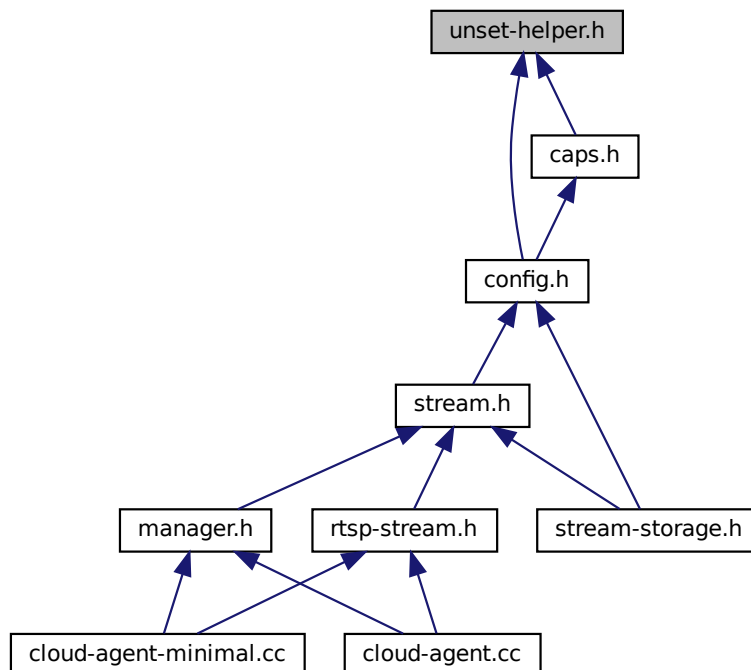
## 11.31 unset-helper.h File Reference

```
#include <chrono>
#include <limits>
#include <nlohmann/json.hpp>
#include <string>
#include <vector>
```

Include dependency graph for unset-helper.h:



This graph shows which files directly or indirectly include this file:



## Data Structures

- struct [alter\\_bool](#)

*alternative bool class Standard bool type has two states, this class adds 3rd state - undefined.*

## Namespaces

- [vsg](#)
- [vsg::cloud](#)
- [vsg::cloud::time\\_spec](#)

*time point*

## Functions

- **std::string** [unset\\_value\\_for\\_impl](#) ( **std::string** \*)
- int [unset\\_value\\_for\\_impl](#) (int \*)  
*Returns value of int type that can be treated as unset.*
- double [unset\\_value\\_for\\_impl](#) (double \*)
- uint64\_t [unset\\_value\\_for\\_impl](#) (uint64\_t \*)
- int64\_t [unset\\_value\\_for\\_impl](#) (int64\_t \*)
- [vsg::cloud::time](#) [unset\\_value\\_for\\_impl](#) ([vsg::cloud::time](#) \*)
- [vsg::cloud::duration](#) [unset\\_value\\_for\\_impl](#) ([vsg::cloud::duration](#) \*)
- [nlohmann::json](#) [unset\\_value\\_for\\_impl](#) ([nlohmann::json](#) \*)
- template<typename T >  
T [unset\\_value\\_for](#) ()  
*Template function which returns object value treated as 'unset' or uninitialized.*
- template<typename T >  
**std::vector**< T > [unset\\_value\\_for\\_impl](#) ( **std::vector**< T > \*)
- template<typename T >  
T [unset\\_value\\_for\\_impl](#) (T \*)
- template<typename T >  
bool [\\_\\_is\\_unset](#) (T)  
*Used for objects constructed from json, helps to check if original json object has specific field.*
- template<> bool [\\_\\_is\\_unset](#)< int > (int t)  
*Predicate function checks if int value was not initialized.*
- template<> bool [\\_\\_is\\_unset](#)< std::string > ( **std::string** t)
- template<> bool [\\_\\_is\\_unset](#)< double > (double t)
- template<> bool [\\_\\_is\\_unset](#)< [vsg::cloud::time](#) > ([vsg::cloud::time](#) t)
- template<> bool [\\_\\_is\\_unset](#)< [vsg::cloud::duration](#) > ([vsg::cloud::duration](#) t)
- template<> bool [\\_\\_is\\_unset](#)< [nlohmann::json](#) > ([nlohmann::json](#) t)
- template<> bool [\\_\\_is\\_unset](#)< std::nullptr\_t > ( **std::nullptr\_t** t)
- template<typename T >  
bool [\\_\\_is\\_unset](#) ([nlohmann::json](#) t)
- template<> bool [\\_\\_is\\_unset](#)< [alter\\_bool](#) > ([alter\\_bool](#) t)

## Variables

- const **std::string** [UnsetString](#)
- const [vsg::cloud::time](#) [UnsetTime](#)
- const [vsg::cloud::duration](#) [UnsetDuration](#)
- const int [UnsetInt](#)
- const double [UnsetFloat](#)
- const double [UnsetDouble](#)
- const uint64\_t [UnsetUInt64](#)
- const int64\_t [UnsetInt64](#)

## 11.31.1 Function Documentation

### 11.31.1.1 `__is_unset()` [1/2]

```
template<typename T >
bool __is_unset (
    nlohmann::json t ) [inline]
```

Definition at line 155 of file unset-helper.h.

### 11.31.1.2 `__is_unset()` [2/2]

```
template<typename T >
bool __is_unset (
    T ) [inline]
```

Used for objects constructed from json, helps to check if original json object has specific field.

You need to declare template specification for new types.

See also

[\\_\\_is\\_unset<int>\(int t\)](#)

Template Parameters

<i>T</i>	object of type
----------	----------------

Returns

true If object's field was actually set during construction, i.e. original json has such field in it's body.

false If object's field wasn't set, original json has no such field. It's also possible that json has such field but its value is set to value treated as unset value.

See also

[\\_\\_is\\_unset<>\(\)](#)

Definition at line 104 of file unset-helper.h.

#### 11.31.1.3 `__is_unset< alter_bool >()`

```
template<>
bool __is_unset< alter_bool > (
    alter_bool t ) [inline]
```

Definition at line 219 of file unset-helper.h.

#### 11.31.1.4 `__is_unset< double >()`

```
template<>
bool __is_unset< double > (
    double t ) [inline]
```

Definition at line 126 of file unset-helper.h.

#### 11.31.1.5 `__is_unset< int >()`

```
template<>
bool __is_unset< int > (
    int t ) [inline]
```

Predicate function checks if int value was not initialized.

##### Template Parameters

<i>int</i>	
------------	--

##### Parameters

<i>t</i>	
----------	--

##### Returns

true value is uninitialized.

false value is initialized.

##### See also

[unset\\_value\\_for<int>\(\)](#)

Definition at line 116 of file unset-helper.h.

#### 11.31.1.6 `__is_unset<nlohmann::json>()`

```
template<>
bool __is_unset< nlohmann::json > (
    nlohmann::json t ) [inline]
```

Definition at line 141 of file unset-helper.h.

#### 11.31.1.7 `__is_unset<std::nullptr_t>()`

```
template<>
bool __is_unset< std::nullptr_t > (
    std::nullptr_t t ) [inline]
```

Definition at line 150 of file unset-helper.h.

#### 11.31.1.8 `__is_unset<std::string>()`

```
template<>
bool __is_unset< std::string > (
    std::string t ) [inline]
```

Definition at line 121 of file unset-helper.h.

#### 11.31.1.9 `__is_unset<vxg::cloud::duration>()`

```
template<>
bool __is_unset< vxg::cloud::duration > (
    vxg::cloud::duration t ) [inline]
```

Definition at line 136 of file unset-helper.h.

#### 11.31.1.10 `__is_unset<vxg::cloud::time>()`

```
template<>
bool __is_unset< vxg::cloud::time > (
    vxg::cloud::time t ) [inline]
```

Definition at line 131 of file unset-helper.h.

#### 11.31.1.11 `unset_value_for()`

```
template<typename T >
T unset_value_for ( )
```

Template function which returns object value treated as 'unset' or uninitialized.

#### Template Parameters

$T$	
-----	--

#### Returns

$T$  Value equals to conditionally 'unset'.

Definition at line 73 of file unset-helper.h.

#### 11.31.1.12 unset\_value\_for\_impl() [1/10]

```
double unset_value_for_impl (  
    double * ) [inline]
```

Definition at line 39 of file unset-helper.h.

#### 11.31.1.13 unset\_value\_for\_impl() [2/10]

```
int unset_value_for_impl (  
    int * ) [inline]
```

Returns value of int type that can be treated as unset.

#### Returns

int

Definition at line 35 of file unset-helper.h.

#### 11.31.1.14 unset\_value\_for\_impl() [3/10]

```
int64_t unset_value_for_impl (  
    int64_t * ) [inline]
```

Definition at line 47 of file unset-helper.h.



**11.31.1.15 unset\_value\_for\_impl() [4/10]**

```
nlohmann::json unset_value_for_impl (  
    nlohmann::json * ) [inline]
```

Definition at line 62 of file unset-helper.h.

**11.31.1.16 unset\_value\_for\_impl() [5/10]**

```
std::string unset_value_for_impl (  
    std::string * ) [inline]
```

Definition at line 27 of file unset-helper.h.

**11.31.1.17 unset\_value\_for\_impl() [6/10]**

```
template<typename T >  
std::vector<T> unset_value_for_impl (  
    std::vector< T > * ) [inline]
```

Definition at line 78 of file unset-helper.h.

**11.31.1.18 unset\_value\_for\_impl() [7/10]**

```
template<typename T >  
T unset_value_for_impl (  
    T * )
```

Definition at line 85 of file unset-helper.h.

**11.31.1.19 unset\_value\_for\_impl() [8/10]**

```
uint64_t unset_value_for_impl (  
    uint64_t * ) [inline]
```

Definition at line 43 of file unset-helper.h.

#### 11.31.1.20 `unset_value_for_impl()` [9/10]

```
vxg::cloud::duration unset_value_for_impl (  
    vxg::cloud::duration * ) [inline]
```

Definition at line 57 of file unset-helper.h.

#### 11.31.1.21 `unset_value_for_impl()` [10/10]

```
vxg::cloud::time unset_value_for_impl (  
    vxg::cloud::time * ) [inline]
```

Definition at line 51 of file unset-helper.h.

### 11.31.2 Variable Documentation

#### 11.31.2.1 `UnsetDouble`

```
const double UnsetDouble
```

Definition at line 229 of file unset-helper.h.

#### 11.31.2.2 `UnsetDuration`

```
const vxg::cloud::duration UnsetDuration
```

Definition at line 225 of file unset-helper.h.

#### 11.31.2.3 `UnsetFloat`

```
const double UnsetFloat
```

Definition at line 228 of file unset-helper.h.

#### 11.31.2.4 UnsetInt

```
const int UnsetInt
```

Definition at line 227 of file unset-helper.h.

#### 11.31.2.5 UnsetInt64

```
const int64_t UnsetInt64
```

Definition at line 231 of file unset-helper.h.

#### 11.31.2.6 UnsetString

```
const std::string UnsetString
```

Definition at line 223 of file unset-helper.h.

#### 11.31.2.7 UnsetTime

```
const vxg::cloud::time UnsetTime
```

Definition at line 224 of file unset-helper.h.

#### 11.31.2.8 UnsetUInt64

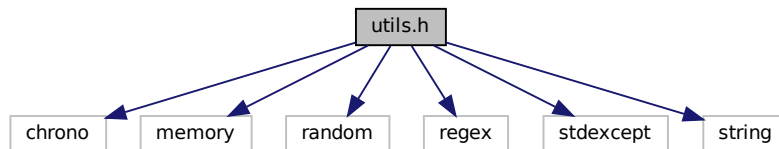
```
const uint64_t UnsetUInt64
```

Definition at line 230 of file unset-helper.h.

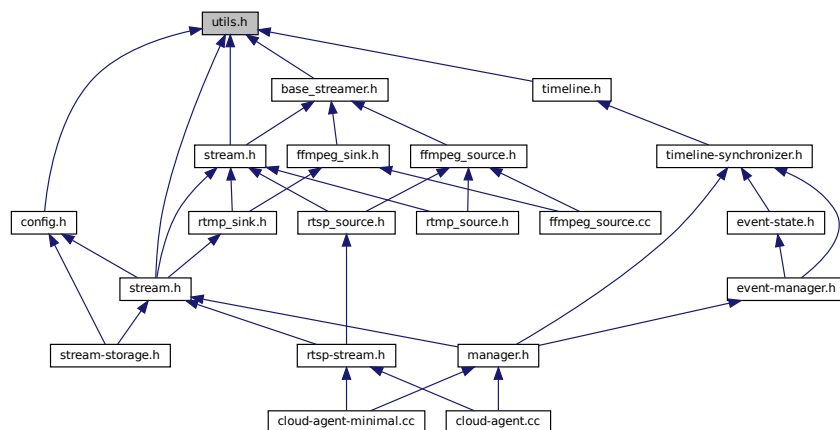
## 11.32 utils.h File Reference

```
#include <chrono>
#include <memory>
#include <random>
#include <regex>
#include <stdexcept>
#include <string>
```

Include dependency graph for utils.h:



This graph shows which files directly or indirectly include this file:



### Data Structures

- struct [vxg::cloud::utils::uri](#)
- struct [vxg::cloud::utils::motion::map](#)

### Namespaces

- [vxg](#)
- [vxg::cloud](#)
- [vxg::cloud::time\\_spec](#)  
*time point*
- [vxg::cloud::utils](#)
- [vxg::cloud::utils::time](#)
- [vxg::cloud::utils::motion](#)
- [vxg::cloud::utils::gcc\\_abi](#)
- [std](#)

## Typedefs

- using `vvg::cloud::time_spec::precision_ratio` = `std::micro`

## Functions

- void `vvg::cloud::utils::set_thread_name` ( `std::string` name)
- `cloud::time` `vvg::cloud::utils::time::now` ()
- `std::string` `vvg::cloud::utils::time::now_ISO8601.UTC` ()
- `std::string` `vvg::cloud::utils::time::now_ISO8601.UTC_packed` ()
- `std::string` `vvg::cloud::utils::time::to_iso_8601` (`cloud::time` t)
- `std::string` `vvg::cloud::utils::time::to_iso` (`cloud::time` t)
- `std::string` `vvg::cloud::utils::time::to_iso2` (`cloud::time` t)
- `std::string` `vvg::cloud::utils::time::to_iso_packed` (`cloud::time` t)
- `std::string` `vvg::cloud::utils::time::to_iso_local` (`cloud::time` t)
- `cloud::time` `vvg::cloud::utils::time::from_double` (`double` t)
- `double` `vvg::cloud::utils::time::to_double` (`cloud::time` t)
- `cloud::time` `vvg::cloud::utils::time::from_iso` ( `std::string` st)
- `cloud::time` `vvg::cloud::utils::time::from_iso2` ( `std::string` st)
- `cloud::time` `vvg::cloud::utils::time::from_iso_packed` ( `std::string` st)
- `bool` `vvg::cloud::utils::time::iso_time_valid` (`const std::string` &s)
- `cloud::time` `vvg::cloud::utils::time::null` ()
- `cloud::time` `vvg::cloud::utils::time::epoch` ()
- `cloud::time` `vvg::cloud::utils::time::max` ()
- `bool` `vvg::cloud::utils::time::is_iso_packed` (`const std::string` &s)
- `bool` `vvg::cloud::utils::time::is_iso` (`const std::string` &s)
- `template<typename... Args>`  
`std::string` `vvg::cloud::utils::string_format` (`const std::string` &format, `Args...` args)
- `std::string` `vvg::cloud::utils::string_trim` (`const std::string` &name, `std::regex` regx)
- `std::string` `vvg::cloud::utils::string_trim` (`const std::string` &name)
- `std::vector< std::string >` `vvg::cloud::utils::string_split` (`const std::string` &s, `char` delimiter)
- `bool` `vvg::cloud::utils::string_startswith` ( `std::string` const &fullString, `std::string` const &start)
- `bool` `vvg::cloud::utils::string_endswith` ( `std::string` const &fullString, `std::string` const &ending)
- `bool` `vvg::cloud::utils::string_replace` ( `std::string` &str, `const std::string` &from, `const std::string` &to)
- `std::string` `vvg::cloud::utils::string_urlencode` (`const std::string` &value)
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- `std::string` `vvg::cloud::utils::string_tolower` (`const std::string` &s)
- `std::string` `vvg::cloud::utils::string_toupper` (`const std::string` &s)
- `bool` `vvg::cloud::utils::string_contains` ( `std::string` s, `char` c)
- `bool` `vvg::cloud::utils::string_contains` ( `std::string` s, `std::string` substring)
- `std::string` `vvg::cloud::utils::dirname` (`const std::string` &filepath)
- `std::string` `vvg::cloud::utils::gcc_abi::demangle` ( `std::string` name)
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- `template<typename T, typename... CONSTRUCTOR_ARGS>`  
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