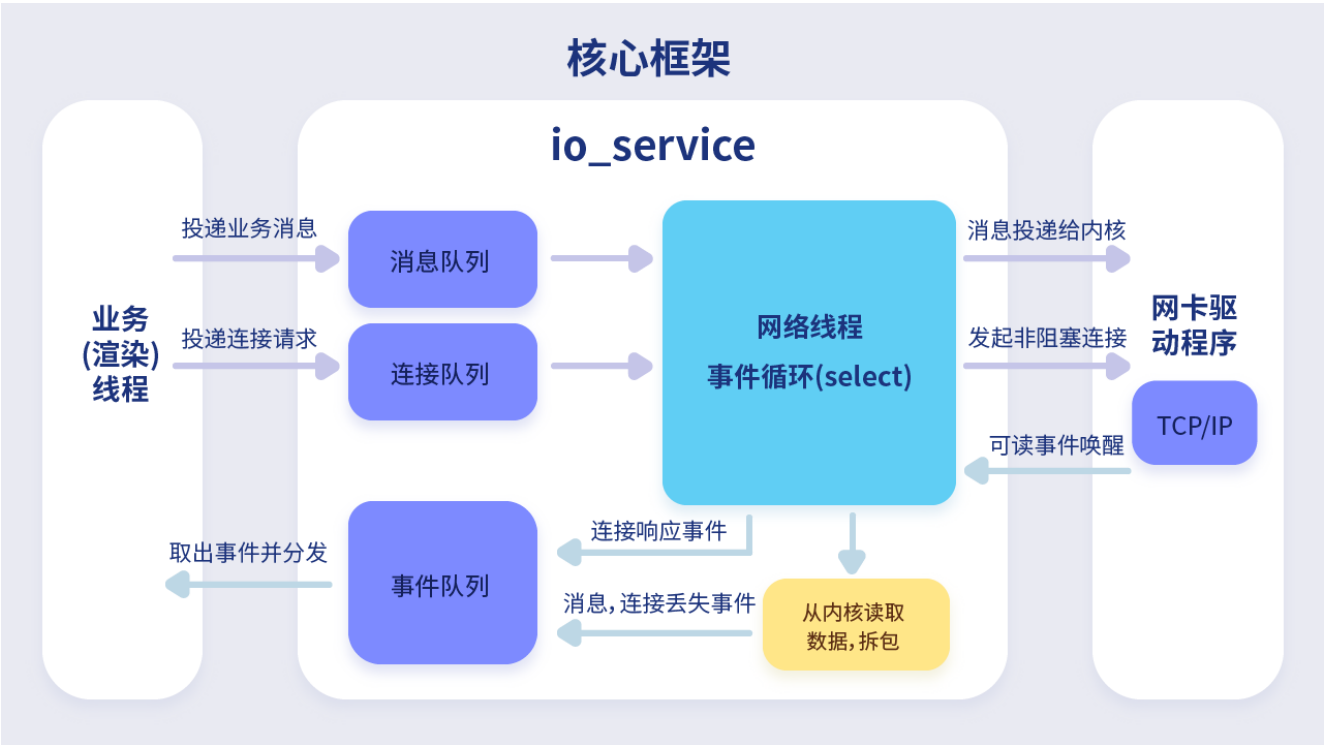


yasio 4F656568
2D878763

docs passing

yasio 2F4F2A7B2F17F2B75F37625F69socket556C15F04FA3377A54FA4F54C85B625F64765B625B377A517C6D11B9

- 2B55F327:
 - 7E8958:
 - Visual Studio 2013+
 - GCC4.7+
 - xcode9+
 - 5A6B2263 C++11,14,17 697E8928
 - 6764: x86, x64, ARM4B32
 - 644F797F: Windows, macOS, Linux, FreeBSD, iOS, Android7932
- 2F2B:
 - 517E6D21: io_service
 - 4F23: io_channel
 - 4E851A8B: io_transport
- 6B62FE:



5F905F59
EB1F00CB

69594E7A8F68E3E4 tool.chinaz.com 6389http89655E537874651706289

C++

```
#include "yasio/yasio.hpp"
#include "yasio/obstream.hpp"
using namespace yasio;
using namespace yasio::inet;
int main()
{
    io_service service({"tool.chinaz.com", 80});
    service.set_option(YOPT_S_DEFERRED_EVENT, 0); // dispatch network event on network thread
    service.start([&](event_ptr&& ev) {
        switch (ev->kind())
        {
        case YEK_ON_PACKET: {
            auto packet = std::move(ev->packet());
            fwrite(packet.data(), packet.size(), 1, stdout);
            fflush(stdout);
            break;
        }
        case YEK_ON_OPEN:
            if (ev->status() == 0)
            {
                auto transport = ev->transport();
                if (ev->cindex() == 0)
                {
                    obstream obs;
                    obs.write_bytes("GET /index.htm HTTP/1.1\r\n");

                    obs.write_bytes("Host: tool.chinaz.com\r\n");

                    obs.write_bytes("User-Agent: Mozilla/5.0 (Windows NT 10.0; "
                                   "WOW64) AppleWebKit/537.36 (KHTML, like Gecko) "
                                   "Chrome/87.0.4820.88 Safari/537.36\r\n");
                    obs.write_bytes("Accept: */*;q=0.8\r\n");
                    obs.write_bytes("Connection: Close\r\n\r\n");

                    service.write(transport, std::move(obs.buffer()));
                }
            }
            break;
        case YEK_ON_CLOSE:
            printf("The connection is lost.\n");
            break;
        }
    });
    // open channel 0 as tcp client
    service.open(0, YCK_TCP_CLIENT);
    getchar();
}
```

Lua

```
local ip138 = "tool.chinaz.com"
local service = yasio.io_service.new({host=ip138, port=80})
local respdata = ""
```

```
service:start(function(ev)
    local k = ev.kind()
    if (k == yasio.YEK_ON_PACKET) then
        respdata = respdata .. ev:packet():to_string()
    elseif k == yasio.YEK_ON_OPEN then
        if ev:status() == 0 then -- connect succeed
            local transport = ev:transport()
            local obs = yasio.obstream.new()
            obs:write_bytes("GET / HTTP/1.1\r\n")

            obs:write_bytes("Host: " .. ip138 .. "\r\n")

            obs:write_bytes("User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64) AppleWebKit/
537.36 (KHTML, like Gecko) Chrome/79.0.3945.117 Safari/537.36\r\n")
            obs:write_bytes("Accept: */*;q=0.8\r\n")
            obs:write_bytes("Connection: Close\r\n\r\n")

            service:write(transport, obs)
        end
    elseif k == yasio.YEK_ON_CLOSE then
        print("request finish, respdata: " .. respdata)
    end
end)

-- Open channel 0 as tcp client and start non-blocking tcp 3 times handshake
service:open(0, yasio.YCK_TCP_CLIENT)

-- Call this function at thread which focus on the network event.
function gDispatchNetworkEvent(...)
    service:dispatch(128) -- dispatch max events is 128 per frame
end

_G.yaservice = service -- Store service to global table as a singleton instance
```

6D8B & 794F
4B05 3A8B



8F88 Lua 794F7A5E9F4F62535F5E4F69 yasio - ibstream_view::consume out of range! FF8F69794F7A5E9169615176FF8B4E5F576139
6642 3A8B6B8F6C1A53766238E16E 6C692F3A8B6B8F6C456F69846CF76D65286F62

- 6D8B:
 - echo_server: TCP/UDP/KCP 6B646D2168
 - echo_client: TCP/UDP/KCP 6B64A9627E
 - ssltest: SSL 6B89A9627E, 6969github.com 4B985B6378846E626E
 - tcptest: TCP 4B897A6F

- [speedtest](#): TCP,UDP,KCP
- [mcast](#):
- [794F3A8B](#):
- [ftp_server](#): yasio ftp
- [lua](#): Lua http TCP
- [xlua](#): xlua
- [DemoUE4](#): UE4

7F8B 6D8B & 794F
16D1 4BD5 3A8B

- C++11 msvc , gcc , clang
- git , cmake installed
- :

```
git clone https://github.com/yasio/yasio
cd yasio
git submodule update --init --recursive
cd build
# for xcode should be: cmake .. -GXcode
cmake ..
cmake --build . --config Debug
```


io_service Class

```
socket.select tcp, udp, kcp, ssl-client
```

```
EDD5
```

```
namespace yasio { namespace inet { class io_service; } }
```

```
6254  
1058
```

```
515167905165  
6C718420FD70
```

Name	Description
io_service::io_service	io_service

```
6C516985
```

Name	Description
io_service::start	
io_service::stop	
io_service::open	
io_service::close	
io_service::is_open	
io_service::dispatch	
io_service::write	
io_service::write_to	DGRAM

Name	Description
io_service::schedule	
io_service::init_globals	
io_service::cleanup_globals	
io_service::channel_at	
io_service::set_option	

object_pool

yasio.hpp

io_service::io_service

io_service

```
io_service::io_service();

io_service::io_service(int channel_count);

io_service::io_service(const io_hostent& channel_ep);

io_service::io_service(const io_hostent* channel_eps, int channel_count);
```

channel_count

channel_ep

channel_eps

4F698F2A5757657499575789

794F
3A8B

```
#include "yasio/yasio.hpp"
int main() {
    using namespace yasio;
    using namespace yasio::inet;
    io_service s1; // s1 only support 1 channel
    io_service s2(5); // s2 support 5 channels concurrency
    io_service s3(io_hostent{"github.com", 443}); // s3 support 1 channel
    io_hostent hosts[] = {
        {"192.168.1.66", 20336},
        {"192.168.1.88", 20337},
    };
    io_service s4(hosts, YASIO_ARRAYSIZE(hosts)); // s4 support 2 channels concurrency
    return 0;
}
```

io_service::start

54527F7C67577F7A82

```
void start(io_event_cb_t cb);
```

5365
2278

cb

7F7E4E4E5983FF6E8B49C9534E57 io_service::dispatch 8C75897F7A895E82

794F
3A8B

```
#include "yasio/yasio.hpp"
int main() {
    using namespace yasio;
    using namespace yasio::inet;
    auto service = yasio_shared_service(io_hostent{host="ip138.com", port=80});
    service->start([](event_ptr&& ev) {
        auto kind = ev->kind();
        if (kind == YEK_ON_OPEN)
        {
            if (ev->status() == 0)
                printf("[%d] connect succeed.\n", ev->cindex());
            else
                printf("[%d] connect failed!\n", ev->cindex());
        }
    });
}
```

```
    return 0;
}
```

io_service::stop

59697f7e67527f7a39

```
void stop()
```

6061
e80f

59697f7e67527f7a69528f88, 6951654f539990514f535e795f51695e995139
64fd791a616160fae1f77649857663880fa62

io_service::open

525f4f9939

```
void open(size_t cindex, int kind);
```

5365
c270

cindex

4f53295f39

kind

4f53798939

6061
e80f

5948 TCP, 664af9425168529997985932f14b6267fa7aef978ef382

cindex 7959cf98594eio_service52c953f3794f59639f89

kind 5f986f4f4e674f504f4f:
cf782f456b6a3e3c4b66

- YCK_TCP_CLIENT
- YCK_TCP_SERVER
- YCK_UDP_CLIENT
- YCK_UDP_SERVER
- YCK_KCP_CLIENT
- YCK_KCP_SERVER

- YCK_SSL_CLIENT

io_service::close

51254F89628946854A8B89

```
void close(transport_handle_t transport);  
void close(int cindex);
```

5365
C278

transport

5C895185764F8F4A8B89

cindex

5C895185764F8F89

6C61
E88F

EB8E TCP 6F 5C4A5389409E74662C5898E6389

io_service::is_open

52A04F89624F8F4A8B8954694E525F726989

```
bool is_open(transport_handle_t transport) const;  
bool is_open(int cindex) const;
```

5365
C278

transport

4F8F4F8B536789
20831A8B53C482

cindex

4F89205F89

8F5650
B4DE3C

true: 5355FF false: 2A5355

io_service::dispatch

52	6D	7F	7E	7E	7A	4E	75	76	4E	4E	30
06	3E	51	DC	BF	0B	A7	1F	84	8B	F6	02

```
void dispatch(int max_count);
```

53	65
C2	70

max_count

67	6B	67	59	52	6D	4E	4E	65	30
2C	21	00	27	06	3E	8B	F6	70	02

6C	61
E8	0F

1A5E68656C5E5F57515357F17E4E4E764E52908F7F7A8C75, 4F59Cocos2d-x766E677F7A8C4E53514E6E675F64(Unity,UE4)764E908F7F7A39

6B	65	6C	5B	4E	5B	51	57	66	65	6E	62	75	97	97	5E	67	75	30
64	B9	D5	F9	8E	89	68	30	F4	B0	38	0F	4C	62	5E	38	09	28	02

794F
3A8B

```
yasio_shared_service()->dispatch(128);
```

io_service::write

54	4F	8F	4F	88	8F	7A	53	90	65	63	30
11	20	93	1A	DD	DC	EF	D1	01	70	6E	02

```
int write(
    transport_handle_t thandle,
    std::vector<char> buffer,
    io_completion_cb_t completion_handler = nullptr
);
```

5365
C270

thandle

4F	8F	4F	8B	53	67	30
20	93	1A	DD	E5	C4	02

buffer

89	53	90	76	4E	8F	52	7F	51	53	30
81	D1	01	84	8C	DB	36	13	82	3A	02

```
completion_handler
```

53	90	5B	62	56	8C	30
D1	01	8C	10	DE	03	02

8F5650
04DE3C

645F53897662598276, < 0 : F86F637F198F89

6C61
E88F

completion_handler 4F2F63 KCP 39

7Abuffer4A796388F5756F4E464A8A63 completion_handler 89

io_service::write_to

54UDP28834A886389766289

```
int write_to(  
    transport_handle_t thandle,  
    std::vector<char> buffer,  
    const ip::endpoint& to,  
    io_completion_cb_t completion_handler = nullptr  
);
```

5365
2270

thandle

4F834A88E3C289

buffer

89538976buffer89

to

895389768F7A575789

completion_handler

618188166E8189

8F5650
04DE3C

765F538976598276, 5F < 0 F86F6F637F198F8F1A582F26834A88F273E5(TCP8E63A86678)89

6C61
E88F

63F07845E7284E DGRAM 28834A886F73 UDP, KCP 39

538988166E8189 completion_handler 4F2F63 KCP 39

buffer completion_handler

io_service::schedule

```
highp_timer_ptr schedule(  
    const std::chrono::microseconds& duration,  
    timer_cb_t cb  
);
```

duration

cb

std::shared_ptr

```
// Register a once timer, timeout is 3 seconds.  
yasio_shared_service()->schedule(std::chrono::seconds(3), []()->bool{  
    printf("time called!\n");  
    return true;  
});  
  
// Register a loop timer, interval is 5 seconds.  
auto loopTimer = yasio_shared_service()->schedule(std::chrono::seconds(5), []()->bool{  
    printf("time called!\n");  
    return false;  
});
```

io_service::init_globals

```
static void init_globals(print_fn2_t print_fn);
```


6C61
E80F

5378578081788F6354E15845E55F63786E8369A86958(.dll,.so)52E598837869F8656E6E89954787A5FE2A8869

io_service::channel_at

8A87EF83725F87624E99E36489

```
io_channel* channel_at(size_t cindex) const;
```

5365
C270

cindex

4F937965

8F5650
04DE3C

4F93E3646788, 53795F5889FA83F4F86E845E nullptr 89

io_service::set_option

887E889889

```
void set_option(int opt, ...);
```

5365
C270

opt

8893674E, 89E768 YOPT_X_XXX.

794F
3A8B

```
#include "yasio/yasio.hpp"

int main(){
    using namespace yasio;
    using namespace yasio::inet;
    io_hostent hosts[] = {
        {"192.168.1.66", 20336},
        {"192.168.1.88", 20337},
    };
    auto service = std::make_shared<io_service>(hosts, YASIO_ARRAYSIZE(hosts));
```

```
// for application protocol with length field, you just needs set this option.
// it's similar to java netty length frame based decode.
// such as when your protocol define as following
//     packet.header: (header.len=12bytes)
//         code:int16_t
//         datalen:int32_t (not contains packet.header.len)
//         timestamp:int32_t
//         crc16:int16_t
//     packet.data
service->set_option(YOPT_C_LFBFD_PARAMS,
    0,      // channelId, the channel index
    65535, // maxFrameLength, max packet size
    2,      // lenghtFieldOffset, the offset of length field
    4,      // lengthFieldLength, the size of length field, can be 1,2,4
    12,     // lengthAdjustment. If the value of length feild ==
packet.header.len + packet.data.len, this parameter should be 0, otherwise should be
sizeof(packet.header)
);

// for application protocol without length field, just sets length field size to -1.
// then io_service will dispatch any packet received from server immediately,
// such as http request, this is default behavior of channel.
service->set_option(YOPT_C_LFBFD_PARAMS, 1, 65535, -1, 0, 0);
return 0;
}
```

8B5396
F7C205

[io_event Class](#)

[io_channel Class](#)

[io_service Options](#)

[xxsocket Class](#)

[obstream Class](#)

[ibstream_view Class](#)

[ibstream Class](#)

io_channel Class

TCP/SSL/UDP/KCP

```
namespace yasio { namespace inet { class io_channel; } }
```

Name	Description
io_channel::get_service	io_service
io_channel::index	
io_channel::remote_port	
io_channel::bytes_transferred	
io_channel::connect_id	ID

io_service
io_service::channel_at

io_channel::get_service

io_service

```
io_service& get_service()
```

io_channel::index

87624f998f7a7ae3

```
int index() const
```

io_channel::remote_port

87624f998f7a7ae3.

```
u_short remote_port() const;
```

8f5650
04de3c

8f564f998f7a7ae3f7

- f98e2377a4f9988799a1798f7a7ae3
- f98e6757a4f99887976547ae3

io_channel::bytes_transferred

87624f998f7a7ae3f7

```
long long bytes_transferred() const;
```

8f5650
04de3c

4e8e63fa7a5f585520ff633658598265ff786c284ef88a2377a636641c7

io_channel::connect_id

87624f998f7a7ae3f7id

```
unsigned int connect_id() const;
```

8f5650
04de3c

58677a4f9955208f63id



[io_service Class](#)

[io_event Class](#)

io_event Class

io_service

```
namespace yasio { namespace inet { class io_event; } }
```

Name	Description
io_event::kind	
io_event::status	
io_event::passive	
io_event::packet	
io_event::timestamp	
io_event::transport	
io_event::transport_id	ID
io_event::transport_ud	

io_event::kind

```
int kind() const;
```


8F	56	50
D4	DE	3C

4E	4E	7C	57	FF	53	4E	66	4E	4E	50
8B	F6	7B	8B	0C	EF	E5	2F	E5	0B	3C

- **YEK_ON_PACKET** : 80 6F 4E FE
- **YEK_ON_OPEN** : 53 50 68 4F 6C F8 4E A9 57 7A 41 93 6C 4E 88 8F A3 50 54
- **YEK_ON_CLOSE** : 73 20 68 6E 6C FC F8 4E A9 57 7A 41 93 6C 4E 88 8F A3 52 59

8F5650
D4DE3C

886963241578, 286727454F73 std::move GC636F4E4E4E639080696389

io_event::timestamp

8362464E4F79785F7978F8F2956230

```
highp_time_t timestamp() const;
```

8F5650
D4DE3C

547C7E65956551795F7978F8F2956230
8CF8B6F6F4E87384AE62A7F6F43362

io_event::transport

8362464E4F784F8F4A8B53C782

```
transport_handle_t transport() const;
```

8F5650
D4DE3C

8F565367FF5F6552655F4E4E65FF4F8F4F8B5367505065FF4E53754F575750688F30
D4DEE5C46C533638AD6868F6F66C20931A00E5C4F231486C5FF285C38403C048362

io_event::transport_id

8362464E4F784F8F4A8B53C782ID82

```
unsigned int transport_id() const;
```

8F5650
D4DE3C

324F637863747883648561785F4EID82
4B682867747883648561785F4EID82

io_event::transport_ud

887E628363288F4A8B7857656230

```
template<typename _Uty>  
_Uty io_event::transport_ud();
```

```
template<typename _Uty>
void io_event::transport_ud(_Uty uservalue);
```

6C61
E80F

73676789E1F97874 userdata 7951E8, 6F59:

- 65506FA3FA7A62524E4E6558A0 userdata
- 62536FA325574E4E626574 userdata

8B5396
F7C205

[io_service Class](#)

[io_channel Class](#)

obstream Class

634f4f8b525f175252f0b9

- 13.35.0basic_obstreamC++
- obstreamint16~int64float/double, ,
- fast_obstream

8b6c
ed05

```
namespace yasio {  
using obstream = basic_obstream<endian::network_convert_tag>;  
using fast_obstream = basic_obstream<endian::host_convert_tag>;  
}
```



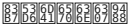


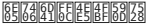
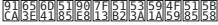
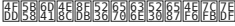
6254
1058

515167905165
6c718420fd70


Name	Description
obstream::obstream	obstream

5151656c
6c718905

Name	Description
obstream::write	
obstream::write_ix	(7bit Encoded Int/Int64)
obstream::write_v	(7bit Encoded Int)
obstream::write_byte	

Name	Description
obstream::write_bytes	
obstream::empty	
obstream::data	
obstream::length	
obstream::buffer	
obstream::clear	
obstream::shrink_to_fit	
obstream::save	



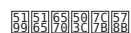
: obstream.hpp

obstream::obstream

 obstream 

```
obstream(size_t capacity = 128);  
  
obstream(const obstream& rhs);  
  
obstream(obstream&& rhs);
```

obstream::write



```
template<typename _Nty>  
void obstream::write(_Nty value);
```

5365
C270

value

8951517959
8159636439

6C61
E88F

_Nty 5849795757456948671~8598263637957626979795739

obstream::write_ix

6632/644F6968594F7Bit Encoded Int656F887F6459516989

```
template<typename _Intty>
void obstream::write_ix(_Intty value);
```

5365
C270

value

895151795989
815963643982

6C61
E88F

_Intty 795753896959487957

- int32_t
- int64_t

64F9796829797969696F7C68AE8Fdotnet59486165

- [BinaryWriter.Write7BitEncodedInt](#)
- [BinaryWriter.Write7BitEncodedInt64](#)

obstream::write_v

51514E8F5268626C6C63529F5E5788(7Bit Encoded Int).

```
void write_v(cxx17::string_view sv);
```

5365
C270

sv

89515176596238
81996364786282

6C61
E88F

69F17851497Bit Encoded7678636F51515162627F26, 608972 write_bytes 515159826362.

ostream::write_byte

515114A598238
99632A578282

```
void write_byte(uint8_t value);
```

5365
C270

value

895151765938
819963643C82

6C61
E88F

69F1785289784F4E ostream::write

ostream::write_bytes

51515982637C38
99635982787C82

```
void write_bytes(cxx17::string_view sv);  
  
void write_bytes(const void* data, int length);  
  
void write_bytes(std::streamoff offset, const void* data, int length);
```

5365
C270

sv

5151string_view5388685982637C.

data

8951515982637C4749865757.
8199635982787C4749865757.

length

895151598265757479955.
816965578278746477A6.

offset

895151598265757479685979.
816965578278746477E8674F79.

6C61
E88F

offset + length 70505F985C4E obstream::length
645C5F786F6E

obstream::empty

5260406F524E7A82
24A0406F263A7A82

```
bool empty() const;
```

8F5650
04DE3C

true 7A; false 927A82
7A; false 927A82

6C61
E88F

695168784F4E length == 082
6978784F4E

obstream::data

83536563639439
87D8786E878882

```
const char* data() const;
```

```
char* data();
```

8F5650
04DE3C

598260656388575739
598260656388575739

obstream::length

8353609F5E82
87D8409FA682

```
size_t length() const;
```

8F5650
D4DE3C

8F56604F532476685982F539
64664126632864685782F539

ostream::buffer

8F56604F532476685982F539
64664126632864685782F539

```
const std::vector<char>& buffer() const;  
  
std::vector<char>& buffer();
```

8F5650
D4DE3C

69642875632456236F22457F78
std::move 629069

794F
3A8B

```
// ostream_buffer.cpp  
// compile with: /EHsc  
#include "yasio/ostream.hpp"  
  
int main( )  
{  
    using namespace yasio;  
    using namespace cxx17;  
  
    ostream obs;  
    obs.write_v("hello world!");  
  
    const auto& const_buffer = obs.buffer();  
  
    // after this line, the obs will be empty  
    auto move_buffer = std::move(obs.buffer());  
  
    return 0;  
}
```

ostream::clear

6F7460FF4F4F587539
6566416C4F4F587539

```
void clear();
```

6C61
E80F

6BFD78651A2165buffer5158FF594E8A653759755F1753582758677583

ostream::shrink_to_fit

2A524065E815623A1A55655882

```
void shrink_to_fit();
```

ostream::save

5C6045764F8F52598278624F5852654F82

```
void save(const char* filename) const;
```

794F
3A8B

```
// ostream_save.cpp
// compile with: /EHsc
#include "yasio/ostream.hpp"
#include "yasio/istream.hpp"

int main( )
{
    using namespace yasio;
    using namespace cxx17;

    ostream obs;
    obs.write_v("hello world!");
    obs.save("ostream_save.bin");

    istream ibs;
    if(ibs.load("ostream_save.bin")) {
        // output should be: hello world!
        try {
            std::count << ibs.read_v() << "\n";
        }
        catch(const std::exception& ex) {
            std::count << "read_v fail: " <<
                << ex.message() << "\n";
        }
    }

    return 0;
}
```



[ibstream_view Class](#)

[ibstream Class](#)

ibstream_view Class

634f4f88f52725f57525f8832

6567

27238f5271627682b6c5569597362468b9f34762fa std::out_of_range 625832

886C
EDD5

```
namespace yasio {  
  // 206ff7f287686c4f81528f6259825ff6c8925a8516c4685  
  using ibstream_view = basic_ibstream_view<endian::network_convert_tag>;  
  
  // 206ff7f287686c4f81528f6259825ff6c8925a8516c4685  
  using fast_ibstream_view = basic_ibstream_view<endian::host_convert_tag>;  
}
```

6254
1058

62716728

Name	Description
ibstream_view::ibstream_view	672812a ibstream_view 688c

5151656C
6C7189b5

Name	Description
ibstream_view::reset	917f5f235ff27539362 2b6885c68f17167862
ibstream_view::read	2d7821776c88637838
ibstream_view::read_ix	f1632a776c8863 (7bit Encoded Int/Int64) 937838
ibstream_view::read_v	88625e772657 (7bit Encoded Int/Int64) 294e86327832

Name	Description
ibstream_view::read_byte	<code>1A5982</code>
ibstream_view::read_bytes	<code>5B95E4E8F526563 6879A7FA68C6B367862</code>
ibstream_view::empty	<code>24495B26A7A</code>
ibstream_view::data	<code>6364178626788</code>
ibstream_view::length	<code>63641278F</code>
ibstream_view::advance	<code>545278584968F86869</code>
ibstream_view::seek	<code>78A84184F8686869</code>

`6C61
E80F`

`ibstream_view` `C++17` `std::string_view`, `GC`

`896C
8142`

`5487F8`: `ibstream.hpp`

ibstream_view::ibstream_view

`ibstream_view`

```
ibstream_view();  
  
ibstream_view(const void* data, size_t size);  
  
ibstream_view(const obstream* obs);
```

`5365
C278`

data

`85C8E85753488856686850575082`

size

5F	53	5E	52	53	4E	8F	52	65	63	59	5C	30
85	CD	8F	17	16	8C	DB	36	79	6E	27	0F	02

obs

5D	5E	52	53	76	6D	39
F2	8F	17	16	84	41	02

ibstream_view::reset

```
91 7F ibstream_view 7F 51 89 56 30
CD 6E 13 B2 C6 FE 02
```

```
void ibstream_view::reset(const void* data, size_t size);
```

53	65
C2	70

data

5F	53	5E	52	53	4E	8F	52	65	63	99	57	57	30
85	CD	8F	17	16	8C	DB	36	70	6E	96	30	40	02

size

5F	53	5E	52	53	4E	8F	52	65	63	59	5C	30
85	CD	8F	17	16	8C	DB	36	70	6E	27	0F	02

ibstream_view::read

4E	6D	4E	88	53	65	50	30
CE	41	2D	FB	D6	70	3C	02

```
template<typename _Nty>
_Nty ibstream_view::read();
```

8F	56	50
D4	DE	3C

8F	56	8B	52	76	50
D4	DE	FB	30	84	3C

6C	61
E8	0F

Nty

5B	96	7C	57	53	4E	66	4E	61
9E	45	7B	8B	EF	E5	2F	FB	0F

 1~8

5B	82	65	65	7C	57	62	6D	79	7C	57	39
57	82	74	70	7B	8B	16	6E	B9	7B	8B	02

ibstream_view::read_ix

```
8B 53 7Bit Encoded Int 53 7F 7F 78 76 65 65 50 30
FB D6 8B 29 16 01 84 74 70 3C 02
```

```
template<typename _Intty>
_Intty ibstream_view::read_ix();
```


8F5650
04DE3C

32/644F53785089

6C61
E80F

_Intty 795F985F4E4E7C57

- int32_t
- int64_t

7C7D787C8B4E Microsoft dotnet 894E7D78

- [BinaryReader.Read7BitEncodedInt\(\)](#)
- [BinaryReader.Read7BitEncodedInt64\(\)](#)

ibstream_view::read_v

8B5353974E8F52636282

```
cxx17::string_view read_v();
```

8F5650
04DE3C

8F56885352794E8F5263638956FF65 GC39

6C61
E80F

7C7D787A4B8B53 7bit Encoded Int827576797897A658FF8B8978 read_bytes 8B534E8F525982786282

ibstream_view::read_byte

8B5312A578282

```
uint8_t read_byte();
```

8F5650
04DE3C

uint8_t5082

6C61
E80F

675163784F4E ibstream_view::read

ibstream_view::read_bytes

FB62676A9F5A598263626C63 GC82

```
cxx17::string_view read_bytes();
```

8F5650
D4DE3C

4F6B52636274 cxx17::string_view 7B67636F62

ibstream_view::empty

52636069544E7A82
24AD412F263A7A82

```
bool empty() const;
```

8F5650
D4DE3C

true 7A; false 604E8159535414F598262
412BFB11632B12A598262

6C61
E80F

696363784F4E length == 082

ibstream_view::data

8F56606363639482
D46E41786E678882

```
const char* data() const;
```

8F5650
D4DE3C

8F6E6354694E78464A598276678882

istream_view::length

8752609275E39

```
size_t length() const;
```

8F5659
D4DE3C

5F52609275E39
53404177A682

istream_view::advance

545279526D8B536F6839
1140FBAB41FB66386782

```
void advance(ptrdiff_t offset);
```

5365
C278

offset

89545279527659799139
811140FBAB844FFBCE82

6C61
E86F

82*offset*4F8D65FF525364E379528B536F6839
261F78419CB1E3FBAB8B66386782

istream_view::seek

79528B536F6839
FBABFB66386782

```
ptrdiff_t seek(ptrdiff_t offset, int whence);
```

5365
C278

offset

84*whence*76517959799139
8173844FFBCE82

whence

544E78644EC68F63674E50FF SEEK_SET, SEEK_CUR, SEEK_END 82
2849496C8E

8F5650
04DE3C

8F5E78A85A78F84E6D885982597989

ibstream Class

634F4E8B525962528F54536F5753528882

8B6C
EDD5

```
namespace yasio {  
using ibstream = basic_ibstream<endian::network_convert_tag>;  
// F8F87F787A6CFF5F82FF8C3C6C7F8F8F  
using fast_ibstream = basic_ibstream<endian::host_convert_tag>;  
}
```

6254
1058

515167885165
6C718428FD78

Name	Description
ibstream::ibstream	849818F ibstream F88C

5151656C
6C7189D5

Name	Description
ibstream::load	FE68FE628F6D

7E625C6B7E67
E77F4221D384

ibstream_view

ibstream

ibstream::ibstream

6788464E ibstream F88C89

```
istream(std::vector<char> blob);  
  
istream(const ostream* obs);
```

`blob`

`obs`

`ostream`

`istream::load`

`istream::load`

`istream::load`

`istream::load`

```
bool load(const char* filename) const;
```

`load`

`true` `false`

`ostream::save`

`ostream::save`


`ostream`

`ostream Class`

`io_service Class`

xxsocket Class

bsd socket API yasio



```
xxsocket accept_n xxx_n socket
```

```
namespace yasio { namespace inet { class xxsocket; } }
```

Name	Description
xxsocket::xxsocket	xxsocket

Name	Description
xxsocket::xpconnect	TCP
xxsocket::xpconnect_n	TCP
xxsocket::pconnect	TCP
xxsocket::pconnect_n	TCP
xxsocket::pserve	tcp
xxsocket::swap	socket
xxsocket::open	socket

Name	Description
xxsocket::reopen	 socket
xxsocket::is_open	 socket 
xxsocket::native_handle	 socket 
xxsocket::release_handle	 socket 
xxsocket::set_nonblocking	 socket 
xxsocket::test_nonblocking	 socket 
xxsocket::bind	 
xxsocket::bind_any	 
xxsocket::listen	 TCP 
xxsocket::accept	 TCP 
xxsocket::accept_n	 TCP 
xxsocket::connect	
xxsocket::connect_n	 
xxsocket::send	
xxsocket::send_n	
xxsocket::recv	
xxsocket::recv_n	
xxsocket::sendto	 DGRAM 
xxsocket::recvfrom	 DGRAM 

Name	Description
xxsocket::handle_write_ready	 xxsocket
xxsocket::handle_read_ready	 xxsocket
xxsocket::local_endpoint	 xxsocket
xxsocket::peer_endpoint	 xxsocket
xxsocket::set_keepalive	 tcp keepalive
xxsocket::reuse_address	 xxsocket
xxsocket::exclusive_address	 xxsocket
xxsocket::select	 xxsocket
xxsocket::shutdown	 xxsocket
xxsocket::close	 xxsocket
xxsocket::tcp_rtt	 tcp rtt.
xxsocket::get_last_errno	 xxsocket
xxsocket::set_last_errno	 xxsocket
xxsocket::strerror	 xxsocket
xxsocket::gai_strerror	 getaddrinfo
xxsocket::resolve	 xxsocket
xxsocket::resolve_v4	 ipv4
xxsocket::resolve_v6	 ipv6
xxsocket::resolve_v4to6	 ipv4V4MAPPED

Name	Description
<code>xxsocket::resolve_tov6</code>	<code>ipv4</code> <code>ipv6</code> <code>V4MAPPED</code>
<code>xxsocket::getipsv</code>	<code>ip</code>
<code>xxsocket::traverse_local_address</code>	

xxsocket::xxsocket

`xxsocket`

```
xxsocket::xxsocket();  
xxsocket::xxsocket(socket_native_type handle);  
xxsocket::xxsocket(xxsocket&& right);  
xxsocket::xxsocket(int af, int type, int protocol);
```

`handle`

`handle`

`socket` `xxsocket`

`right`

`move`

`af`

`ip`

`protocol`

`TCP/UDP` `0`

xxsocket::xpconnect

`TCP`

```
int xxsocket::xpconnect(const char* hostname, u_short port, u_short local_port = 0);
```

`hostname`

`hostname`

`IP` `16` `5760`

port

818f63675258797af2389

local_port

7c50984f7af23f76c6b8850 0 88798967529189

6c61e80f

4fa152686b2c67626179ip538f68727c89

8f5650b4de3c

0: 6252ff < 0 5929ff908f xxsocket::get_last_errno 8753938f7989

xxsocket::xpconnect_n

8f6c7a675258ffa7aTCP8f6389

```
int xxsocket::xpconnect_n(const char* hostname, u_short port, const std::chrono::microseconds& wtimeout, u_short local_port = 0);
```

5365c270

hostname

818f636752584b6754ffef4e6f IP67a 16 5760 89

port

818f63675258797af2389

local_port

7c50984f7af23f76c6b8850 0 88798967529189

wtimeout

fa7a8f6389f8629582

8f5650b4de3c

0: 6252ff < 0 5929ff908f xxsocket::get_last_errno 8753938f7989

6c61e80f

4fa152686b2c67626179ip538f6882

xxsocket::pconnect

54 8f 7a 67 57 58 ff 7a TCP 8f a3 39

```
int xxsocket::pconnect(const char* hostname, u_short port, u_short local_port = 0);
int xxsocket::pconnect(const endpoint& ep, u_short local_port = 0);
```

53 65
c2 70

hostname

81 8f a3 67 57 58 ff 7a 67 58 ff ff 45 2f IP 57 57 57 57 57

ep

81 8f a3 67 57 58 ff 7a 67 57 57 39

port

81 8f a3 67 57 58 ff 7a ff e3 39

local_port

67 57 98 4f 7a ff 53 ff ff ff ff 88 79 89 67 52 91 39 0 88 79 89 67 52 91 39

8f 56 50
64 6e 3c

0: 63 52 ff < 0 51 29 6f 1a 8f xxsocket::get_last_errno 87 53 93 ff 79 39

6c 61
e8 0f

4f 4f c8 69 67 67 6f 61 79 ip 57 57 68 68

xxsocket::pconnect_n

54 8f 7a 67 57 58 ff 7a TCP 8f a3 39

```
int pconnect_n(const char* hostname, u_short port, const std::chrono::microseconds& wtimeout,
u_short local_port = 0);
int pconnect_n(const char* hostname, u_short port, u_short local_port = 0);
int pconnect_n(const endpoint& ep, const std::chrono::microseconds& wtimeout, u_short
local_port = 0);
int pconnect_n(const endpoint& ep, u_short local_port = 0);
```

53 65
c2 70

hostname

81 8f a3 67 57 58 ff 7a 67 58 ff ff 45 2f IP 57 57 57 57 57

ep

818f63675258795757b9

port

818f63675258797af3b9

local_port

6750904f7af3f76c6b8b50 0 88798f675291b9

wtimeout

fa7a8f6389f8f505b9

8f5650
b4de3c

0: 1052ff < 0 51296c1a87 xxsocket::get_last_errno 875393ef79b9

xxsocket::pserve

5f546757TCP6752795430
002f2c300da1d12c02

```
int pserve(const char* addr, u_short port);  
int pserve(const endpoint& ep);
```

5365
c270

addr

676a636a7f61 IP5a77 b9

ep

6767575739
2c5a5040b2

port

TCP79547af3b9

8f5650
b4de3c

0: 1052ff < 0 51296c1a87 xxsocket::get_last_errno 875393ef79b9

794f
3a8b

```
// xxsocket-serve.cpp  
#include <signal.h>  
#include <vector>  
#include "yasio/xxsocket.hpp"
```

```
using namespace yasio;
using namespace yasio::inet;

xxsocket g_server;
static bool g_stopped = false;
void process_exit(int sig)
{
    if (sig == SIGINT)
    {
        g_stopped = true;
        g_server.close();
    }
    printf("exit");
}
int main()
{
    signal(SIGINT, process_exit);

    if (g_server.pserve("0.0.0.0", 1219) != 0)
        return -1;
    const char reply_msg[] = "hi, I'm server\n";
    do
    {
        xxsocket cs = g_server.accept();
        if (cs.is_open())
        {
            cs.send(reply_msg, sizeof(reply_msg) - 1);
            std::this_thread::sleep_for(std::chrono::milliseconds(100));
        }
    } while (!g_stopped);

    return 0;
}
```

xxsocket::swap

 socket

```
xxsocket& swap(xxsocket& who);
```



who





xxsocket 

xxsocket::open

xxsocket

```
bool open(int af = AF_INET, int type = SOCK_STREAM, int protocol = 0);
```

af

AF_INET (ipv4) AF_INET6 (ipv6)

type

SOCK_STREAM (TCP), SOCK_DGRAM (UDP)

protocol

TCP/UDP 0

true: false xxsocket::get_last_errno

xxsocket::reopen

xxsocket

```
bool reopen(int af = AF_INET, int type = SOCK_STREAM, int protocol = 0);
```

af

AF_INET (ipv4) AF_INET6 (ipv6)

type

SOCK_STREAM (TCP), SOCK_DGRAM (UDP)

protocol

TCP/UDP 0

true: false xxsocket::get_last_errno

6C61
E80F

8267socket50635F6F6851654F5151F56F6B2168636F82

xxsocket::is_open

52A8socket2F24F2536682

```
bool is_open() const;
```

8F5650
D4DE3C

true: 2953666F false: 5A636682

xxsocket::native_handle

8368socket654F6F6F7882

```
socket_native_type native_handle() const;
```

8F5650
D4DE3C

socket6748636F786F yasio::inet::invalid_socket 887A2848socket82

xxsocket::release_handle

21636555socket6F6F78A7564382

```
socket_native_type release_handle() const;
```

8F5650
D4DE3C

21635274socket6748636F78

xxsocket::set_nonblocking

887Asocket748278825A6F82

```
int set_nonblocking(bool nonblocking) const;
```


5365
C270

nonblocking

true: 9798586A5F6F false: 9858215F62

8F5650
04DE3C

0: 6252FF < 0 5129FFA987 xxsocket::get_last_errno 875393287932

xxsocket::test_nonblocking

6840socket6F544E9798586A5F62

```
int test_nonblocking() const;
```

8F5650
04DE3C

1: 9798586A5F6F 0: 9858215F62

6C61
E80F

6840winsock26F544E9798586A5F62 SOCK_STREAM 7057socket1A645E -1 32

xxsocket::bind

7F5Asocket676767575739

```
int bind(const char* addr, unsigned short port) const;  
int bind(const endpoint& ep) const;
```

5365
C270

addr

676763587F53ip575739

port

817158737F5339

ep

897158737F53575739

8F5650
04DE3C

0: 1052FF < 0 5129FF9A07 xxsocket::get_last_errno 875393EF7039

xxsocket::bind_any

7F5Asocket276A4B61506089

```
int bind_any(bool ipv6) const;
```

5365
C270

ipv6

6F547F5B67674E61IPv65767
2F26616A2C3A4B0F

8F5650
04DE3C

0: 1052FF < 0 5129FF9A07 xxsocket::get_last_errno 875393EF7039

xxsocket::listen

6F2B705263EA TCP69577A63E746F96589

```
int listen(int backlog = SOMAXCONN) const;
```

5365
C270

backlog

6F5970546589
8027612C7889

8F5650
04DE3C

0: 1052FF < 0 5129FF9A07 xxsocket::get_last_errno 875393EF7039

xxsocket::accept

6353464F5B627A8F6389

```
xxsocket accept() const;
```

8F5650
04DE3C

5458627A984F78 xxsocket FB8C39

xxsocket::accept_n

878858636F6A57664F58577A8E6389

```
int accept_n(socket_native_type& new_sock) const;
```

5365
C278

new_sock

83FAE2686C6458627A984F786554socketE3C455Z8

8F5650
04DE3C

0: 6252FF < 0 5928FF98CF xxsocket::get_last_errno 8763938F7889

6C61
E88F

82676857658F58 0 6Fnew_sock 4A28887E4E2798586A6F82

8978687A7848586CF8762A38373 xxsocket::set_nonblocking 66socket887E4A2798586A6F82

xxsocket::connect

FA7A8E6389

```
int connect(const char* addr, u_short port);  
int connect(const endpoint& ep);
```

5365
C278

addr

8F7A4867ip575789

port

8F7A48677A5389

ep

8F7A4867575789

8F5650
04DE3C

0: f252ff < 0 5929ff1a2f xxsocket::get_last_errno 8753932ff7839

6061
e88f

TCP: 5189TCP 4f69e362

UDP: f57a43375758

xxsocket::connect_n

f57a8fa339
fa7a8fa339

```
int connect_n(const char* addr, u_short port, const std::chrono::microseconds& wtimeout);  
int connect_n(const endpoint& ep, const std::chrono::microseconds& wtimeout);  
int connect_n(const endpoint& ep);
```

5365
c298

addr

8f7a4667575739
8f7a4667575739

port

8f7a4667575739
8f7a4667575739

ep

8f7a4667575739
8f7a4667575739

wtimeout

f57a8fa33980f6f6f339
f57a8fa33980f6f6f339

8F5650
04DE3C

0: f252ff < 0 5929ff1a2f xxsocket::get_last_errno 8753932ff7839

6061
e88f

TCP: 5189TCP 4f69e362

UDP: f57a43375758

xxsocket::connect_n

xxsocket::connect_n

```
int disconnect() const;
```

xxsocket::connect_n

```
if (errno < 0) xxsocket::get_last_errno
```

xxsocket::connect_n

SOCK_DGRAM (UDP) socket

xxsocket::send

xxsocket::send

```
int send(const void* buf, int len, int flags = 0);
```

xxsocket::send

buf

xxsocket::send

len

xxsocket::send

flags

xxsocket::send

xxsocket::send

```
if (len < 0) xxsocket::get_last_errno
```

xxsocket::send_n

xxsocket::send_n

```
int send_n(const void* buf, int len, const std::chrono::microseconds& wtimeout, int flags = 0);
```

5365
C270

buf

89518863627680595982575739

len

895188636276955E39

wtimeout

618188F6F6F482

flags

618178625542678839

8F5650
04DE3C

```
==len: 6252FF < len 598DFF9A8F xxsocket::get_last_errno 835395887839
```

xxsocket::recv

AE516863298F7A4E6751888F67769656239

```
int recv(void* buf, int len, int flags = 0) const;
```

5365
C270

buf

A352786275B25A39

len

A352786275B25A725E39

flags

A35278625542678839

8F5650
04DE3C

```
==len: 6252FF < len 598DFF9A8F xxsocket::get_last_errno 835395887839
```

6C61
E88F

68F17869547A538F59FF53614Esocket678E695469 8288589A5E 39

xxsocket::recv_n

5480F2F2F2A1566A4E8A9862FA636A7F56786289

```
int recv_n(void* buf, int len, const std::chrono::microseconds& wtimeout, int flags = 0)
const;
```

5365
C278

buf

6368686275615A82

len

6368686275615A7F5682

wtimeout

636880F2F2F282

flags

636363635F5C688882

8F5659
D4DE3C

```
==len: 6252FF < len 598D6C7A8F xxsocket::get_last_errno 835395887882
```

xxsocket::sendto

54807A4E675188 DGRAM 68UDP686362

```
int sendto(const void* buf, int len, const endpoint& to, int flags = 0) const;
```

5365
C278

buf

656188686275615A82

len

656188686275615A7F5682

to

6181786857565682

flags

618178625554688882

8F5650
04DE3C

```
==len: 6252FF < len 5989FF99FF xxsocket::get_last_errno 835395887839
```

xxsocket::recvfrom

4E815888248C7A4E675189276374986282

```
int recvfrom(void* buf, int len, endpoint& peer, int flags = 0) const;
```

5365
C278

buf

A358986275515A89

len

A358986275515A955682

peer

A35898626468FF85FA239889

flags

A35898625E5C688882

8F5650
04DE3C

```
==len: 6252FF < len 5989FF99FF xxsocket::get_last_errno 835395887839
```

6C61
E88F

68716869547A538458FF52514Esocket6788585468 828858235F 82

xxsocket::handle_write_ready

785Fsocket535182

```
int handle_write_ready(const std::chrono::microseconds& wtimeout) const;
```

5365
C278

wtimeout

785F886262F282

8F5650
04DE3C

0: 80F3FF 1: F652FF < 0: 5189FF9A8F xxsocket::get_last_errno 876393887989

6C61
E80F

9A585F516861897F6251696F76C95146FF69F67674F7A53846889

xxsocket::handle_read_ready

7865socket278889

```
int handle_read_ready(const std::chrono::microseconds& wtimeout) const;
```

5365
C270

wtimeout

7865806565F389

8F5650
04DE3C

0: 80F3FF 1: F652FF < 0: 5189FF9A8F xxsocket::get_last_errno 876393887989

xxsocket::local_endpoint

876345374994F766757575789

```
endpoint local_endpoint() const;
```

8F5650
04DE3C

8458675757575789

6C61
E80F

59676A6789788F xxsocket::connect 6289TCP8E63328E31626768626F9945846879575768 0.0.0.0

xxsocket::peer_endpoint

876345374994F766767A53846889

```
endpoint peer_endpoint() const;
```

8F5658
04DE3C

8F566257575738
04DE2C30304082

6C61
E88F

5962666969728F xxsocket::connect 1689 TCP8E63369E31626268626E99458F587857572F 0.0.0.0

xxsocket::set_keepalive

887FTCP5E52518878C5F9C23682

```
int set_keepalive(int flag = 1, int idle = 7200, int interval = 75, int probes = 10);
```

5365
C278

flag

1 : 55546555524F88C5F9FF 0 : 71E582

idle

5351785C6C67464F6868454E54FF54525E5C5388C5F8A24878675989F8F8F46C534FF79FF38
5351785C6C67464F6868454E54FF54525E5C5388C5F8A24878675989F8F8F46C534FF79FF38

interval

5351626552C5F836E54F86FCB1585189C5F8A248A2F8F4F4846C534FF79FF38
5351626552C5F836E54F86FCB1585189C5F8A248A2F8F4F4846C534FF79FF38

probes

5351626552C5F836E54F86FCB1585189C5F8A248A2F8F4F4846C534FF79FF38
5351626552C5F836E54F86FCB1585189C5F8A248A2F8F4F4846C534FF79FF38

8F5658
04DE3C

0 : 188F6C < 0 5129FF9A8F xxsocket::get_last_errno 876893887882

794F
3A8B

```
// xxsocket-keepalive.cpp
#include "yasio/xxsocket.hpp"
using namespace yasio;
using namespace inet;

int main(){
    xxsocket client;
    if(0 == client.pconnect("192.168.1.19", 80)) {
```

```
        client.set_keepalive(1, 5, 10, 2);
    }
    return 0;
}
```

xxsocket::reuse_address

xxsocket::reuse_address

```
void reuse_address(bool reuse);
```

xxsocket::reuse_address

reuse

xxsocket::reuse_address

xxsocket::reuse_address

xxsocket::reuse_address

xxsocket::exclusive_address

xxsocket::exclusive_address

```
void exclusive_address(bool exclusive);
```

xxsocket::exclusive_address

exclusive

xxsocket::exclusive_address

xxsocket::exclusive_address

xxsocket::exclusive_address

xxsocket::set_optval

xxsocket::set_optval

```
template <typename _Ty> int set_optval(int level, int optname, const _Ty& optval);
```

5365
C270

level

socket89997F755239

optname

89997C75739

optval

89995039

8F5650
04DE3C

0: 1252FF < 0 5129FF1A2F xxsocket::get_last_errno 8753958F7039

6C61
E80F

64F07554bsd socket setsockopt 528878626CEA2F7F736A6750886CF4696F7F7369

xxsocket::get_optval

887Esocket899939

```
template <typename _Ty> _Ty get_optval(int level, int optname) const
```

5365
C270

level

socket89997F755239

optname

89997C75739

8F5650
04DE3C

846E89995039

6C61
E80F

64F07554bsd socket getsockopt 528878626CEA2F7F736A6750886CF4696F7F7369

xxsocket::select

7952socket846848484839

```
int select(fd_set* readfds, fd_set* writefds, fd_set* exceptfds, const
std::chrono::microseconds& wtimeout)
```

5365
C270

readfds

F2F84848F2F878657430

writefds

F2514848F2F878657430

exceptfds

55584848F2F878657430

wtimeout

7851484889F8484830

8F5650
D4DE3C

0:80F2FF > 0:6252FF < 0:5989FF908F xxsocket::get_last_errno 870819887930

xxsocket::shutdown

73E8TCP48851A9830

```
int shutdown(int how = SD_BOTH) const;
```

5365
C270

how

73E81A987988FFEF204E486A674E50

- SD_SEND : 51891A98
- SD_RECEIVE : 63631A98
- SD_BOTH : 88E873E8

8F5650
04DE3C

0: f252ff < 0: 5129ff992f xxsocket::get_last_errno 876293227932

xxsocket::close

7322socket6f2a62767f446662

```
void close(int shut_how = SD_BOTH);
```

5365
c270

shut_how

73221A9378576f6f2f45404546674e52

- SD_SEND : 53899899
- SD_RECEIVE : 63539999
- SD_BOTH : 21205325
- SD_NONE : 58287325

8F5650
04DE3C

0: f252ff < 0: 5129ff992f xxsocket::get_last_errno 876293227932

6c61
e80f

5262 shut_how != SD_NONE 6f62f0781a488328 shutdown 6f518c786522 close 32

xxsocket::tcp_rtt

8752TCP8f6379RTT32

```
uint32_t tcp_rtt() const;
```

8F5650
04DE3C

8458TCP79RTTf2f2ff6c534f: 5e79 32

xxsocket::get_last_errno

xxsocket::get_last_errno

```
static int get_last_errno();
```

xxsocket::get_last_errno

```
0: errno > 0 ? xxsocket::strerror(errno) : 0
```

xxsocket::get_last_errno

xxsocket::get_last_errno

xxsocket::set_last_errno

xxsocket::set_last_errno

```
static void set_last_errno(int error);
```

xxsocket::set_last_errno

error

xxsocket::set_last_errno

xxsocket::set_last_errno

xxsocket::set_last_errno

xxsocket::not_send_error

xxsocket::not_send_error

```
static bool not_send_error(int error);
```

xxsocket::not_send_error

error

xxsocket::not_send_error

8F5650
04DE3C

true : socket69586C false : socket7260F27E6179938BFC655373E6socket7E629A8F82

6C61
E80F

4E536389644F8F6E58 < 0 F8FC837869FD7882

xxsocket::not_recv_error

72A02F245F8352F2socketFA68E86577E664F38F82

```
static bool not_recv_error(int error);
```

5365
C278

error

78EF7882

8F5650
04DE3C

true : socket69586C false : socket7260F27E6179938BFC655373E6socket7E629A8F82

6C61
E80F

4E53A363644F8F6E58 < 0 F8FC837869FD7882

xxsocket::strerror

5C9588788F634E597B4E38
8619EE816C623A57263282

```
static const char* strerror(int error);
```

5365
C278

error

78EF7882

8F5650
04DE3C

898BFF697659784E38
19EF7F6457283282

xxsocket::gai_strerror

`getaddrinfo`

```
static const char* gai_strerror(int error);
```

`error`

error

`error`

`error`

`error`

xxsocket::resolve

`resolve`

```
int resolve(std::vector<endpoint>& endpoints, const char* hostname, unsigned short port = 0,
            int socktype = SOCK_STREAM);
```

`endpoints`

endpoints

`endpoints`

hostname

`hostname`

port

`port`

socktype

`socktype`

`socktype`

`0: 0 > 0 0 xxsocket::strerror 0`

xxsocket::resolve_v4

IPv4

```
int resolve_v4(std::vector<endpoint>& endpoints, const char* hostname, unsigned short port = 0, int socktype = SOCK_STREAM);
```

endpoints

hostname

port

socktype

socket

0: 00000000 > 0 0000 xxsocket::strerror 00000000

xxsocket::resolve_v6

IPv6

```
int resolve_v6(std::vector<endpoint>& endpoints, const char* hostname, unsigned short port = 0, int socktype = SOCK_STREAM);
```

endpoints

hostname

port

socktype

socket7957397b8b62

8f5650d4de3c

0: 636366ff > 0 9a2f xxsocket::strerror 8f634a887619884f6939

xxsocket::resolve_v4to6

4f89675754535476c5e3606f67652b24IPv457575f8f634aIPv6 V4MAPPED685f393c6f62

```
int resolve_v4to6(std::vector<endpoint>& endpoints, const char* hostname, unsigned short port = 0, int socktype = SOCK_STREAM);
```

5365c270

endpoints

8f5153653983faC27062

hostname

5754396f6062

port

7af339ef

socktype

socket7957397b8b62

8f5650d4de3c

0: 636366ff > 0 9a2f xxsocket::strerror 8f634a887619884f6939

xxsocket::resolve_tov6

89676f60632b64606757576fc5e3606f67652b24IPv457574f8f634aIPv6 V4MAPPED685f393c6f62

```
int resolve_tov6(std::vector<endpoint>& endpoints, const char* hostname, unsigned short port = 0, int socktype = SOCK_STREAM);
```

53	65
C2	70

endpoints

8F	51	53	65	30
93	FA	C2	70	02

hostname

57	54	30
DF	0D	02

port

7A	53	30
EF	E3	02

socktype

socket^{7C}_{7B}⁵⁷_{8B}³⁰₀₂

8F	56	50
D4	DE	3C

```
0: 65 95 88 FF > 0 90 8F xxsocket::strerror 8F 63 4E 8B 7E 95 19 8B 4F 60 30
E0 19 EF 0C 1A C7 6C 62 3A E6 C6 19 EF E1 6F 02
```

xxsocket::getipsv

83 53 67 67 65 63 76 IP 53 88 68 68 5F 4F 30
B7 D6 2C 3A 2F 01 84 4F AE 08 07 D7 4D 02

```
static int getipsv();
```

8F	56	50
D4	DE	3C

- `ipsv_ipv4`: `676767676767`|`Pv4``548889`
- `ipsv_ipv6`: `676767676767`|`Pv6``548889`
- `ipsv_dual_stack`: `676767676767`|`Pv4``54`|`Pv6``5468488989`

6C	61
E8	0F

```
5F 8F 56 50 65 63 53 68 53 8B 66 FF 75 67 5E 5F 59 7E 4F 51 4F 75 IPv4 90 4F FF
53 04 DE 3C 2F 01 CC 08 4F AE 2F 0C 28 37 94 53 CB C8 18 48 7F 28 1A E1 0C
```

4F 59 66 80 62 67 88 59 57 54 65 5F 54 8C 87 7A 7F 7E 65 FF 5C 4F 4F 51 90 62 88 82 7A FD 4B 3A BE 07 28 0C F6 00 2F wifi 8C 02 9D 51 DC F6 0C 06 1A 18 48 09 E9 wifi 0C

📶wifi📶IPv4: <https://github.com/halx99/yasio/issues/130>

79	4F
3A	8B

```
// xxsocket-ipsv.cpp
#include <vector>
#include "yasio/xxsocket.hpp"
using namespace yasio;
using namespace yasio::inet;
```

```
int main(){
    const char* host = "github.com";
    std::vector<ip::endpoint> eps;
    int flags = xxsocket::get_ipsv();
    if(flags & ipsv_ipv4) {
        xxsocket::resolve_v4(eps, host, 80);
    }
    else if(flags & ipsv_ipv6) {
        xxsocket::resolve_tov6(eps, host, 80);
    }
    else {
        std::cerr << "Local network not available!\n";
    }
    return 0;
}
```

xxsocket::traverse_local_address

674E6767575769
9A3E676A564069

```
static void traverse_local_address(std::function<bool(const ip::endpoint&)> handler);
```

5365
C270

handler

674E5757568C39
9A3E30400E0362

794F
3A8B

```
// xxsocket-traverse.cpp
#include <vector>
#include "yasio/xxsocket.hpp"
using namespace yasio;
using namespace yasio::inet;
int main(){
    int flags = 0;
    xxsocket::traverse_local_address([&](const ip::endpoint& ep) -> bool {
        switch (ep.af())
        {
            case AF_INET:
                flags |= ipsv_ipv4;
                break;
            case AF_INET6:
                flags |= ipsv_ipv6;
                break;
        }
        return (flags == ipsv_dual_stack);
    });
    YASIO_LOG("Supported ip stack flags=%d", flags);
}
```

```
    return flags;  
}
```

8B	53	96
F7	C2	05

[io_service Class](#)

io_service options

io_service

Name	Description
<i>YOPT_S_DEFER_EVENT_CB</i>	Set defer event callback params: callback:defer_event_cb_t remarks: a. User can do custom packet resolve at network thread, such as decompress and crc check. b. Return true, io_service will continue enqueue to event queue. c. Return false, io_service will drop the event.
<i>YOPT_S_DEFERRED_EVENT</i>	Set whether deferred dispatch event, default is: 1 params: deferred_event:int(1)
<i>YOPT_S_RESOLV_FN</i>	Set custom resolve function, native C++ ONLY params: func:resolv_fn_t*
<i>YOPT_S_PRINT_FN</i>	Set custom print function native C++ ONLY parmas: func:print_fn_t remarks: you must ensure thread safe of it
<i>YOPT_S_PRINT_FN2</i>	Set custom print function with log level parmas: func:print_fn2_t you must ensure thread safe of it
<i>YOPT_S_EVENT_CB</i>	Set event callback params: func:event_cb_t*
<i>YOPT_S_TCP_KEEPALIVE</i>	Set tcp keepalive in seconds, probes is tries. params: idle:int(7200), interal:int(75), probes:int(10)
<i>YOPT_S_NO_NEW_THREAD</i>	Don't start a new thread to run event loop. params: value:int(0)
<i>YOPT_S_SSL_CACERT</i>	Sets ssl verification cert, if empty, don't verify. params: path:const char*

Name	Description
<i>YOPT_S_CONNECT_TIMEOUT</i>	Set connect timeout in seconds. params: connect_timeout:int(10)
<i>YOPT_S_DNS_CACHE_TIMEOUT</i>	Set dns cache timeout in seconds. params: dns_cache_timeout : int(600),
<i>YOPT_S_DNS_QUERIES_TIMEOUT</i>	Set dns queries timeout in seconds, default is: 5000. params: dns_queries_timeout : int(5000) remark: a. this option must be set before 'io_service::start' b. only works when have c-ares c. since v3.33.0 it's milliseconds, previous is seconds. d. the timeout algorithm of c-ares is complicated, usually, by default, dns queries will failed with timeout after more than 75 seconds. e. for more detail, please see: https://c-ares.haxx.se/ares_init_options.html
<i>YOPT_S_DNS_QUERIES_TRIES</i>	Set dns queries tries when timeout reached, default is: 5. params: dns_queries_tries : int(5) remarks: a. this option must be set before 'io_service::start' b. relative option: <i>YOPT_S_DNS_QUERIES_TIMEOUT</i>
<i>YOPT_S_DNS_DIRTY</i>	Set dns server dirty. params: reserved : int(1) remarks: a. this option only works with c-ares enabled b. you should set this option after your mobile network changed
<i>YOPT_C_LFBFD_FN</i>	Sets channel length field based frame decode function. params: index:int, func:decode_len_fn_t* remark: native C++ ONLY
<i>YOPT_C_LFBFD_PARAMS</i>	Sets channel length field based frame decode params. params: index:int, max_frame_length:int(10MBytes), length_field_offset:int(-1), length_field_length:int(4), length_adjustment:int(0),

Name	Description
<i>YOPT_C_LFBFD_IBTS</i>	Sets channel length field based frame decode initial bytes to strip. params: index:int, initial_bytes_to_strip:int(0)
<i>YOPT_C_REMOTE_HOST</i>	Sets channel remote host. params: index:int, ip:const char*
<i>YOPT_C_REMOTE_PORT</i>	Sets channel remote port. params: index:int, port:int
<i>YOPT_C_REMOTE_ENDPOINT</i>	Sets channel remote endpoint. params: index:int, ip:const char*, port:int
<i>YOPT_C_LOCAL_HOST</i>	Sets local host for client channel only. params: index:int, ip:const char*
<i>YOPT_C_LOCAL_PORT</i>	Sets local port for client channel only. params: index:int, port:int
<i>YOPT_C_LOCAL_ENDPOINT</i>	Sets local endpoint for client channel only. params: index:int, ip:const char*, port:int
<i>YOPT_C_MOD_FLAGS</i>	Mods channel flags. params: index:int, flagsToAdd:int, flagsToRemove:int
<i>YOPT_C_ENABLE_MCAST</i>	Enable channel multicast mode. params: index:int, multi_addr:const char*, loopback:int
<i>YOPT_C_DISABLE_MCAST</i>	Disable channel multicast mode. params: index:int
<i>YOPT_C_KCP_CONV</i>	The kcp conv id, must equal in two endpoint from the same connection. params: index:int, conv:int
<i>YOPT_T_CONNECT</i>	Change 4-tuple association for io_transport_udp. params: transport:transport_handle_t remark: only works for udp client transport
<i>YOPT_T_DISCONNECT</i>	Dissolve 4-tuple association for io_transport_udp. params: transport:transport_handle_t remark: only works for udp client transport

Name	Description
<code>YOPT_B_SOCKOPT</code>	Sets io_base sockopt. params: io_base*,level:int,optname:int,optval:int,optlen:int

8B5396
F7C205

[io_service Class](#)

API

54547A95
7D0D7AF4

```
namespace yasio {}
```

5151656C
6C71B9D5

Name	Description
yasio::host_to_network	4B6A59825F8C717E59825F
yasio::network_to_host	717E59825F8C717E59825F
yasio::xhighp_clock	876A6362A7F6F433
yasio::highp_clock	876A6362A7F6F433
yasio::clock	876A6362A7F6F433
yasio::set_thread_name	8B7E8C72887E7A5A
yasio::basic_strerror	686F72597B45

yasio::host_to_network

4B6A59825F8C717E59825F82

59654E
3487F6

yasio/detail/endian_portable.hpp

```
template <typename _Ty>  
inline _Ty host_to_network(_Ty value);  
inline int host_to_network(int value, int size);
```

5365
c270

value

818f637d7950ffvalue7657_Ty 2345294f011~859827d507c5739

size

818f637d7950ff3c694857827d6cfafd2f1~4598239

8f5650
64be3c

7f7e59825f695039

794f
3a8b

```
#include <stdio.h>
#include <inttypes.h>
#include "yasio/detail/endian_portable.hpp"
int main(){
    uint16_t v1 = 0x1122;
    uint32_t v2 = 0x11223344;
    uint64_t v3 = 0x1122334455667788;
    // output will be: net.v1=2211, net.v2=44332211, net.v3=8877665544332211
    printf("net.v1=%04" PRIx16 " ", net.v2=%08" PRIx32 " ", net.v3=%016" PRIx64 "\n",
        yasio::host_to_network(v1),
        yasio::host_to_network(v2),
        yasio::host_to_network(v3));
    return 0;
}
```

yasio::network_to_host

7f7e59825f695039

59654f
3487f6

yasio/detail/endian_portable.hpp

```
template <typename _Ty>
inline _Ty network_to_host(_Ty value);
inline int network_to_host(int value, int size);
```

5365
c270

value

818f637d7950ffvalue7657_Ty 2345294f011~859827d507c5739

size

818f637665506765598265ff5380691~4598239

8f5658
646e3c

4f5758825f785839

794f
3a8b

```
#include <stdio.h>
#include <inttypes.h>
#include "yasio/detail/endian_portable.hpp"
int main(){
    uint16_t v1 = 0x2211;
    uint32_t v2 = 0x44332211;
    uint64_t v3 = 0x8877665533442211;
    // output will be: net.v1=1122, net.v2=11223344, net.v3=1122334455667788
    printf("host.v1=%04" PRIx16 " ", host.v2=%08" PRIx32 " ", host.v3=%016" PRIx64 " \n",
        yasio::network_to_host(v1),
        yasio::network_to_host(v2),
        yasio::network_to_host(v3));
    return 0;
}
```

yasio::xhighp_clock

876865727f78936382

59654e
3487f6

yasio/detail/utils.hpp

```
template <typename _Ty = steady_clock_t>
inline highp_time_t xhighp_clock();
```

6a675365
217f6278

_Ty

- yasio::steady_clock_t: 8f685527767ff823237169f82383
- yasio::system_clock_t: 8f68787fUTCf8f463

8F5650
040E3C

7E797F63F36389

yasio::highp_clock

8762AE7379F2F36389

59654E
3487F6

yasio/detail/utils.hpp

```
template <typename _Ty = steady_clock_t>  
inline highp_time_t highp_clock();
```

6A675365
217FC270

_Ty

- yasio::steady_clock_t: 8F5650527C7E63F3638979F2F363
- yasio::system_clock_t: 846E7B7EUTC F2F363

8F5650
040E3C

7E797F63F36389

yasio::clock

8762AE7379F2F36389

59654E
3487F6

yasio/detail/utils.hpp

```
template <typename _Ty = steady_clock_t>  
inline highp_time_t clock();
```

6A675365

_Ty

- yasio::steady_clock_t: 846E53527C7E63F3638979F2F363

- `yasio::system_clock_t`: 8A5B7C7EUTC F2 F4 53

8F5659
04DE3C

EB797E65256238
62A7F6F43382

yasio::set_thread_name

8B7B8573897E7A6439
6662A7F6F43382

59654E
3487F6

yasio/detail/thread_name.hpp

```
inline void set_thread_name(const char* name);
```

5365
C278

name

87898B7E7E7A5479
06818E6E6F6B6DFA

6C61
E80F

6B5165754E8B65597E7A7A5E975E677538
64FD78217F6ECAAD1A6F6B6B8F5E38692862

yasio::basic_strfmt

51636A67FF685F535B7B4E6289585B7B4E38
FD78217F6E6C6F16572B3216896D5B7B4E38

59654E
3487F6

yasio/detail/strfmt.hpp

```
template <class _Elem, class _Traits = std::char_traits<_Elem>,  
          class _Alloc = std::allocator<_Elem>>  
inline std::basic_string<_Elem, _Traits, _Alloc> basic_strfmt(size_t n, const _Elem*  
format, ...);
```

5365
2270

n

5758buffer5959
1058

format

686F597843FF54695155 printf 7854

8F5650
04DE3C

8F68685F535278 std::string 7C5759784E39
040E3C6F106E64

6C61
E80F

68994F73FCE778634F75597E584859785254
0E997F786CE778634F75597E584859785254

- yasio::strfmt: 686F53597855
- yasio::wcsfmt: 686F5358597855

794F
3A8B

```
#include "yasio/detail/strfmt.hpp"
int main() {
    std::string str1 = yasio::strfmt(64, "My age is %d", 19);
    std::wstring str2 = yasio::wcsfmt(64, L"My age is %d", 19);
    return 0;
}
```




`yasio` `yasio/detail/config.hpp`

Name	Description
<code>YASIO_HAVE_KCP</code>	<code>kcp</code>
<code>YASIO_HEADER_ONLY</code>	<code>yasio</code>
<code>YASIO_SSL_BACKEND</code>	<code>SSL</code> <code>SSL</code> <code>OpenSSL/MbedTLS</code> <code>3.36.0</code> <code>(YASIO_HAVE_SSL)</code> <code>1</code> <code>(OpenSSL)</code> <code>2</code> <code>(mbedtls)</code>
<code>YASIO_ENABLE_UDS</code>	<code>unix domain socket</code> <code>unix</code> <code>win10 RS5+</code>
<code>YASIO_HAVE_CARES</code>	<code>c-ares</code> <code>c-ares</code> <code>yasio</code> <code>DNS</code> <code>10</code> <code>c-ares</code>
<code>YASIO_VERBOSE_LOG</code>	
<code>YASIO_NT_COMPAT_GAI</code>	<code>Windows XP</code> <code>getaddrinfo</code> <code>API</code>
<code>YASIO_USE_SPSC_QUEUE</code>	<code>SPSC</code> <code>io_service::write</code>
<code>YASIO_USE_SHARED_PACKET</code>	<code>std::shared_ptr</code>
<code>YASIO_HAVE_HALF_FLOAT</code>	<code>half.hpp</code>
<code>YASIO_DISABLE_OBJECT_POOL</code>	
<code>YASIO_DISABLE_CONCURRENT_SINGLETON</code>	
<code>YASIO_ENABLE_PASSIVE_EVENT</code>	<code>open/close</code>

yasio 7C535974
98050406

yasio 76706853597446468458TCP 6F694EUDP 6C826763897A697E63618067526F4E6945786476656F597439734F6582674E79695F:

- 1A2Fio_service0909 YOPT_C_LFBFD_PARAMS 8B7F4F99536539
- 1A2Fio_service0909 YOPT_C_LFBFD_FN 8B7F815845639F5E8361F078 decode_len_fn_t 09

6C61E80F

8158456897637F46705878F8F554E598269468863int58F86C455846897F78678845A806C647363F8F8863ARM87775982F980E288 SIGBUS 6258E8882E24E5C289817FE961639F267078828 io_channel::__builtin_decode_len 09

YOPT_C_LFBFD_PARAMS

8B7F4F997462F36289

5365C278

max_frame_length

6759539F7F466F888756893A5F586389

length_field_offset

639F26596978F84E68686368628859824FF889

length_field_length

639F26596959686C62631~489829298(uint8_t,uint16_t,uint24_t,int32_t)89

length_adjustment

639F268C645C88995859784F737F7E58825E7F7838886777517F89785395585873 0 6C520124A 8869597F5E 09

6C61E80F

8868639F7F465768C578787F28510C57825E7F7838886777517F89785395585873:

```
int io_channel::__builtin_decode_len(void* d, int n)
{
    int loffset = uparams_.length_field_offset;
    int lsize   = uparams_.length_field_length;
    if (loffset >= 0)
    {
        int len = 0;
        if (n >= (loffset + lsize))
```

```
{
    ::memcpy(&len, (uint8_t*)d + loffset, lsize);
    len = yasio::network_to_host(len, lsize);
    len += uparams_.length_adjustment;
    if (len > uparams_.max_frame_length)
        len = -1;
}
return len;
}
return n;
}
```

decode_len_fn_t

41 93 93 73 68 68 53 9f 56 fd 78 6f 57 88 89

```
typedef std::function<int(void* d, int n)> decode_len_fn_t;
```

53 65
c2 70

d

65 93 53 63 62 88 58 82 57 57 89

n

6f 93 53 63 62 9f a6 89

8f 56 50
84 b6 3c

84 68 88 69 53 78 62 6e 99 9f a6 89

• > 0 : 93 78 63 9f 56 62 57 89

• == 0 : a3 62 78 62 46 89 4f 93 78 88 69 53 68 99 9f 56 6f yasio 55 a2 4a 7f 7e a3 63 63 62 6f 48 63 63 52 63 63 62 6f 4f 6b 21 83 73 62 51 78 89

• < 0 : 93 78 63 9f 56 62 56 6c 4f 99 61 55 52 48 85 4f 88 63 66 89

6c 61
e8 0f

93 78 88 69 53 9f a6 fd 78 c5 98 29 7e 7a 58 51 76 fd 4f 59 f9 4e Lua 19 46 2f 61 88 7e 2a 5a 49 93 78 88 69 53 9f a6 fd 78 89

yasio Interop

Unity C# yasio C: https://github.com/yasio/yasio/blob/master/yasio/bindings/yasio_ni.cpp

OpenNSM2

Unity yasio-3.37.1 NetworkServiceManager unity: <https://github.com/yasio/OpenNSM2>

FAQ

91709598897B
CD89EE98E354

yasio 2446987487685?

yasio 74583f4579988464f80464f7945655f4e4f804e4f8e31904f884e5f595c7478777f63464e9f218959737998737f7f55ffxxsocketf969yasio 749065f23675f69
886f61697648f2546686684eboost.asio82

4545454f75
5Ac0487728yasio?

- 666672f3f27769896964797c7c5567asio,libevent,libev,libuv6c464e63464f9029255f748747c9858f788fio697329576c746c6473f3555247f73
iocp,kqueue,epoll,select7829876f776352967747c7c7c6f896e63747646TCP7663616478f68768768f38f9f636489io697329576c746c6473f3555247f73
- yasio6c8f637974ffTCPc263f951c883246555269
- yasio5cTCP,UDP,KCP7ef466628cf72Transportf962654ef7f2869
- yasiof9982f75f6626275f3274f72select717289

yasio 5f54696397995857548967?

6f616c4687894688c-ares596f6546552f8856973DNS57886f76f745587845d7387select6158765647f736c67669967f68768567f7a889967465652fc-ares6fyasio53
284f4a696967648967667676868467a6887558106282f6f6245f6f628f556676629897488

yasio 2f246663SSL/TLS4685?

6f616c4687894688OpenSSL7289MbedTLS89

594f4eio_event 45887f548353
6265ceuserdata

885383ffhttps://github.com/yasio/ftp_server/blob/master/ftp_server.cpp#L98

yasio 66545974 SIGPIPE 4f53ff
2f266466f1f71f

4e 3.30 782765f8f9697489

636246697a6f6e6889f9f2a263SIGPIPE7963f8f1APP288f6637626f254e283TCP8f632666f6f63326f632f6f4f69: Broken pipe
8829: <https://github.com/yasio/yasio/issues/170>

ios **ec=65, detail:No route to host**

- **ios**:
 - **APP** **ios14.1+** **Local Network Permission**
 - **10161** **SNMP via TLS**
- **APP** **49152~65535**
- **https://www.speedguide.net/port.php**

macOS **UDP** **40** **Message too long**

- **macOS** **UDP** **9126**
- **socket** **UDP**:
 - **xxsocket**: **sock_udp.set_optval(SOL_SOCKET, SO_SNDBUF, (int)65535);**
 - **io_service**: **https://github.com/yasio/yasio/blob/master/tests/speed/main.cpp#L223**

io_service schedule

io_service

std::thread

https://github.com/yasio/yasio/issues/244

xxsocket **_nodelay**

_nonblock **internal**

YOPT_TCP_KEEPALIVE

https://github.com/yasio/yasio/issues/117

Lua

• c++11:

- `kaguya` `c++` `lua_newuserdata`, `placement new`
`xcode clang release`
- `bing.com` `LUA_USER_ALIGNMENT_T=max_align_t`
- `, max_align_t` `xcode clang` `long double` `16`
- `: http://lua-users.org/lists/lua-l/2019-07/msg00197.html`

• c++14:

- `sol2` `sol2` `kaguya` `sol2` `lua_newuserdata`
`clang release`

• c++17:

- `sol2` `xcode` `ios11` `C++17` `new` `Aligned allocation/deallocation`
`-faligned-allocation`
- `ios10` `std::shared_mutex` `(yasio` `Apple` `pthread`)
-
- `Lua` `double` `max_align_t` `C11` `https://en.cppreference.com/w/c/types/max_align_t` `Lua` `ANSI C89` `LUA_USER_ALIGNMENT_T`
- `C++11` `std::max_align_t` `https://en.cppreference.com/w/cpp/types/max_align_t`

`max_align_t` `__stddef_max_align_t.h`

Can't load xxx.bundle on macOS?

The file `xxx.bundle` needs change attr by command `sudo xattr -r -d com.apple.quarantine xxx.bundle`

xxsocket resolve socketype

- `winsock`
- `0` `IP`

`F41A38C1EE98`

`F7C265 987E5E52F3`