

This is a preview of "ISO/IEC TS 19216:201...". [Click here to purchase the full version from the ANSI store.](#)

First edition
2018-04

Programming Languages — C++ Extensions for Networking

Langages de programmation — Extensions C++ pour mise en réseau



Reference number
ISO/IEC TS 19216:2018(E)

© ISO/IEC 2018



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Foreword	vi
1 Scope	1
2 Normative references	2
3 Terms and definitions	3
4 General Principles	4
4.1 Conformance	4
4.2 Acknowledgments	4
5 Namespaces and headers	5
6 Future plans (Informative)	6
7 Feature test macros (Informative)	7
8 Method of description (Informative)	8
8.1 Structure of each clause	8
8.2 Other conventions	8
9 Error reporting	9
9.1 Synchronous operations	9
9.2 Asynchronous operations	10
9.3 Error conditions	10
9.4 Suppression of signals	10
10 Library summary	11
11 Convenience header	13
11.1 Header <code><experimental/net></code> synopsis	13
12 Forward declarations	14
12.1 Header <code><experimental/netfwd></code> synopsis	14
13 Asynchronous model	16
13.1 Header <code><experimental/executor></code> synopsis	16
13.2 Requirements	19
13.3 Class template <code>async_result</code>	27
13.4 Class template <code>async_completion</code>	28
13.5 Class template <code>associated_allocator</code>	29
13.6 Function <code>get_associated_allocator</code>	30
13.7 Class <code>execution_context</code>	30
13.8 Class <code>execution_context::service</code>	32
13.9 Class template <code>is_executor</code>	33
13.10 Executor argument tag	33
13.11 <code>uses_executor</code>	34

13.12	Class template <code>associated_executor</code>	34
13.13	Function <code>get_associated_executor</code>	35
13.14	Class template <code>executor_binder</code>	36
13.15	Function <code>bind_executor</code>	39
13.16	Class template <code>executor_work_guard</code>	40
13.17	Function <code>make_work_guard</code>	41
13.18	Class <code>system_executor</code>	42
13.19	Class <code>system_context</code>	43
13.20	Class <code>bad_executor</code>	44
13.21	Class <code>executor</code>	45
13.22	Function <code>dispatch</code>	49
13.23	Function <code>post</code>	50
13.24	Function <code>defer</code>	51
13.25	Class template <code>strand</code>	52
13.26	Class template <code>use_future_t</code>	56
13.27	Partial specialization of <code>async_result</code> for <code>packaged_task</code>	59
14	Basic I/O services	61
14.1	Header <code><experimental/io_context></code> synopsis	61
14.2	Class <code>io_context</code>	61
14.3	Class <code>io_context::executor_type</code>	65
15	Timers	67
15.1	Header <code><experimental/timer></code> synopsis	67
15.2	Requirements	67
15.3	Class template <code>wait_traits</code>	68
15.4	Class template <code>basic_waitable_timer</code>	69
16	Buffers	73
16.1	Header <code><experimental/buffer></code> synopsis	73
16.2	Requirements	78
16.3	Error codes	82
16.4	Class <code>mutable_buffer</code>	82
16.5	Class <code>const_buffer</code>	83
16.6	Buffer type traits	84
16.7	Buffer sequence access	85
16.8	Function <code>buffer_size</code>	85
16.9	Function <code>buffer_copy</code>	85
16.10	Buffer arithmetic	86
16.11	Buffer creation functions	86
16.12	Class template <code>dynamic_vector_buffer</code>	88
16.13	Class template <code>dynamic_string_buffer</code>	89
16.14	Dynamic buffer creation functions	91
17	Buffer-oriented streams	92
17.1	Requirements	92
17.2	Class <code>transfer_all</code>	94
17.3	Class <code>transfer_at_least</code>	95
17.4	Class <code>transfer_exactly</code>	95
17.5	Synchronous read operations	96
17.6	Asynchronous read operations	98

17.7	Synchronous write operations	99
17.8	Asynchronous write operations	100
17.9	Synchronous delimited read operations	102
17.10	Asynchronous delimited read operations	102
18	Sockets	104
18.1	Header <experimental/socket> synopsis	104
18.2	Requirements	106
18.3	Error codes	115
18.4	Class <code>socket_base</code>	116
18.5	Socket options	118
18.6	Class template <code>basic_socket</code>	121
18.7	Class template <code>basic_datagram_socket</code>	131
18.8	Class template <code>basic_stream_socket</code>	139
18.9	Class template <code>basic_socket_acceptor</code>	145
19	Socket iostreams	157
19.1	Class template <code>basic_socket_streambuf</code>	157
19.2	Class template <code>basic_socket_iostream</code>	161
20	Socket algorithms	164
20.1	Synchronous connect operations	164
20.2	Asynchronous connect operations	165
21	Internet protocol	167
21.1	Header <experimental/internet> synopsis	167
21.2	Requirements	171
21.3	Error codes	173
21.4	Class <code>ip::address</code>	174
21.5	Class <code>ip::address_v4</code>	177
21.6	Class <code>ip::address_v6</code>	181
21.7	Class <code>ip::bad_address_cast</code>	186
21.8	Hash support	187
21.9	Class template <code>ip::basic_address_iterator</code> specializations	187
21.10	Class template <code>ip::basic_address_range</code> specializations	188
21.11	Class template <code>ip::network_v4</code>	190
21.12	Class template <code>ip::network_v6</code>	193
21.13	Class template <code>ip::basic_endpoint</code>	195
21.14	Class template <code>ip::basic_resolver_entry</code>	199
21.15	Class template <code>ip::basic_resolver_results</code>	201
21.16	Class <code>ip::resolver_base</code>	204
21.17	Class template <code>ip::basic_resolver</code>	205
21.18	Host name functions	211
21.19	Class <code>ip::tcp</code>	211
21.20	Class <code>ip::udp</code>	212
21.21	Internet socket options	214
Index		219
Index of library names		221
Index of implementation-defined behavior		227

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 22, *Programming languages, their environments and system software interfaces*.