

Contents

Page

Foreword	vii
1 General	1
1.1 Scope	1
1.2 Normative references	1
1.3 Namespaces, headers, and modifications to standard classes	1
1.4 Terms and definitions	2
1.5 Future plans (Informative)	2
1.6 Feature-testing recommendations (Informative)	3
2 Modifications to the C++ Standard Library	5
2.1 Uses-allocator construction	5
3 General utilities library	6
3.1 Utility components	6
3.1.1 Header <experimental/utility> synopsis	6
3.1.2 Class erased_type	6
3.2 Tuples	6
3.2.1 Header <experimental/tuple> synopsis	6
3.2.2 Calling a function with a tuple of arguments	7
3.3 Metaprogramming and type traits	7
3.3.1 Header <experimental/type_traits> synopsis	7
3.3.2 Other type transformations	11
3.3.3 Logical operator traits	12
3.3.4 Detection idiom	13
3.4 Compile-time rational arithmetic	14
3.4.1 Header <experimental/ratio> synopsis	14
3.5 Time utilities	15
3.5.1 Header <experimental/chrono> synopsis	15
3.6 System error support	15
3.6.1 Header <experimental/system_error> synopsis	15
3.7 Class template propagate_const	15
3.7.1 Class template propagate_const general	15
3.7.2 Header <experimental/propagate_const> synopsis	16
3.7.3 propagate_const requirements on T	18
3.7.3.1 propagate_const requirements on class type T	18
3.7.4 propagate_const constructors	19
3.7.5 propagate_const assignment	19
3.7.6 propagate_const const observers	20
3.7.7 propagate_const non-const observers	20
3.7.8 propagate_const modifiers	21
3.7.9 propagate_const relational operators	21
3.7.10 propagate_const specialized algorithms	23
3.7.11 propagate_const underlying pointer access	23
3.7.12 propagate_const hash support	23
3.7.13 propagate_const comparison function objects	23
4 Function objects	25
4.1 Header <experimental/functional> synopsis	25
4.2 Class template function	26
4.2.1 function construct/copy/destroy	28
4.2.2 function modifiers	29

4.3	Searchers	29
4.3.1	Class template default_searcher	29
4.3.1.1	default_searcher creation functions	30
4.3.2	Class template boyer_moore_searcher	30
4.3.2.1	boyer_moore_searcher creation functions	31
4.3.3	Class template boyer_moore_horspool_searcher	31
4.3.3.1	boyer_moore_horspool_searcher creation functions	32
4.4	Function template not_fn	33
5	Optional objects	34
5.1	In general	34
5.2	Header <experimental/optional> synopsis	34
5.3	optional for object types	35
5.3.1	Constructors	37
5.3.2	Destructor	39
5.3.3	Assignment	40
5.3.4	Swap	43
5.3.5	Observers	43
5.4	In-place construction	44
5.5	No-value state indicator	44
5.6	Class bad_optional_access	45
5.7	Relational operators	45
5.8	Comparison with nullopt	45
5.9	Comparison with T	46
5.10	Specialized algorithms	47
5.11	Hash support	47
6	Class any	48
6.1	Header <experimental/any> synopsis	48
6.2	Class bad_any_cast	49
6.3	Class any	49
6.3.1	any construct/destruct	49
6.3.2	any assignments	50
6.3.3	any modifiers	51
6.3.4	any observers	51
6.4	Non-member functions	51
7	string_view	54
7.1	Header <experimental/string_view> synopsis	54
7.2	Class template basic_string_view	55
7.3	basic_string_view constructors and assignment operators	57
7.4	basic_string_view iterator support	58
7.5	basic_string_view capacity	59
7.6	basic_string_view element access	59
7.7	basic_string_view modifiers	60
7.8	basic_string_view string operations	60
7.8.1	Searching basic_string_view	62
7.9	basic_string_view non-member comparison functions	63
7.10	Inserters and extractors	64
7.11	Hash support	65
8	Memory	66
8.1	Header <experimental/memory> synopsis	66
8.2	Shared-ownership pointers	69
8.2.1	Class template shared_ptr	69
8.2.1.1	shared_ptr constructors	72

	8.2.1.2	shared_ptr observers	74
	8.2.1.3	shared_ptr casts	75
	8.2.1.4	shared_ptr hash support	75
	8.2.2	Class template weak_ptr	75
	8.2.2.1	weak_ptr constructors	76
8.3		Type-erased allocator	77
8.4		Header <experimental/memory_resource> synopsis	77
8.5		Class memory_resource	78
	8.5.1	Class memory_resource overview	78
	8.5.2	memory_resource public member functions	79
	8.5.3	memory_resource protected virtual member functions	79
	8.5.4	memory_resource equality	80
8.6		Class template polymorphic_allocator	80
	8.6.1	Class template polymorphic_allocator overview	80
	8.6.2	polymorphic_allocator constructors	81
	8.6.3	polymorphic_allocator member functions	81
	8.6.4	polymorphic_allocator equality	83
8.7		template alias resource_adaptor	83
	8.7.1	resource_adaptor	83
	8.7.2	resource_adaptor_imp constructors	84
	8.7.3	resource_adaptor_imp member functions	84
8.8		Access to program-wide memory_resource objects	85
8.9		Pool resource classes	85
	8.9.1	Classes synchronized_pool_resource and unsynchronized_pool_resource	85
	8.9.2	pool_options data members	87
	8.9.3	pool resource constructors and destructors	88
	8.9.4	pool resource members	88
8.10		Class monotonic_buffer_resource	89
	8.10.1	Class monotonic_buffer_resource overview	89
	8.10.2	monotonic_buffer_resource constructor and destructor	90
	8.10.3	monotonic_buffer_resource members	91
8.11		Alias templates using polymorphic memory resources	91
	8.11.1	Header <experimental/string> synopsis	91
	8.11.2	Header <experimental/deque> synopsis	92
	8.11.3	Header <experimental/forward_list> synopsis	92
	8.11.4	Header <experimental/list> synopsis	92
	8.11.5	Header <experimental/vector> synopsis	93
	8.11.6	Header <experimental/map> synopsis	93
	8.11.7	Header <experimental/set> synopsis	94
	8.11.8	Header <experimental/unordered_map> synopsis	94
	8.11.9	Header <experimental/unordered_set> synopsis	95
	8.11.10	Header <experimental/regex> synopsis	95
8.12		Non-owning pointers	96
	8.12.1	Class template observer_ptr overview	96
	8.12.2	observer_ptr constructors	97
	8.12.3	observer_ptr observers	97
	8.12.4	observer_ptr conversions	97
	8.12.5	observer_ptr modifiers	97
	8.12.6	observer_ptr specialized algorithms	98
	8.12.7	observer_ptr hash support	99
9		Containers	100
9.1		Uniform container erasure	100

9.1.1	Header synopsis	100
9.1.2	Function template <code>erase_if</code>	101
9.1.3	Function template <code>erase</code>	102
9.2	Class template array	102
9.2.1	Header <code><experimental/array></code> synopsis	102
9.2.2	Array creation functions	103
10	Iterators library	104
10.1	Header <code><experimental/iterator></code> synopsis	104
10.2	Class template ostream_joiner	104
10.2.1	<code>ostream_joiner</code> constructor	105
10.2.2	<code>ostream_joiner</code> operations	105
10.2.3	<code>ostream_joiner</code> creation function	105
11	Futures	106
11.1	Header <code><experimental/future></code> synopsis	106
11.2	Class template promise	106
11.3	Class template packaged_task	107
12	Algorithms library	109
12.1	Header <code><experimental/algorithm></code> synopsis	109
12.2	Search	109
12.3	Sampling	110
12.4	Shuffle	110
13	Numerics library	111
13.1	Generalized numeric operations	111
13.1.1	Header <code><experimental/numeric></code> synopsis	111
13.1.2	Greatest common divisor	111
13.1.3	Least common multiple	111
13.2	Random number generation	112
13.2.1	Header <code><experimental/random></code> synopsis	112
13.2.2	Utilities	112
13.2.2.1	<code>Function template randint</code>	112
14	Reflection library	113
14.1	Class source_location	113
14.1.1	Header <code><experimental/source_location></code> synopsis	113
14.1.2	<code>source_location</code> creation	114
14.1.3	<code>source_location</code> field access	114