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Project: Programming Language C++
Reply to: Beman Dawes <beman@esva.net>

C++ Standard Library Closed Issues List (Revision 11)

Committee Version

Reference ISO/IEC IS 14882:1998(E)

Also see:

- [Table of Contents](#) including both active and closed issues.
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This document contains only library issues which have been closed by the Library Working Group as duplicates or not defects. That is, issues which have a status of [Dup](#) or [NAD](#). See "[C++ Standard Library Active Issues List](#)" for active issues and more information. See "[C++ Standard Library Defect Report List](#)" for issues considered defects. The introductory material in that document also applies to this document.

Closed Issues

6. File position not an offset unimplementable

Section: 27.4.3 [lib.fpos](#) **Status:** [NAD](#) **Submitter:** Matt Austern **Date:** 15 Dec 97

Table 88, in I/O, is too strict; it's unimplementable on systems where a file position isn't just an offset. It also never says just what `fpos<>` is really supposed to be. [Here's my summary, *which Jerry agrees is more or less accurate*. "I think I now know what the class really is, at this point: it's a magic cookie that encapsulates an `mbstate_t` and a file position (possibly represented as an `fpos_t`), it has syntactic support for pointer-like arithmetic, and implementors are required to have real, not just syntactic, support for arithmetic." This isn't standardese, of course.]

Rationale:

Not a defect. The LWG believes that the Standard is already clear, and that the above summary is what the Standard in effect says.

10. `codecvt<>::do_unclear`

Section: 22.2.1.5.2 [lib.locale.codecvt.virtuals](#) **Status:** [Dup](#) **Submitter:** Matt Austern **Date:** 14 Jan 98

Section 22.2.1.5.2 says that `codecvt<>::do_in` and `do_out` should return the value `noconv` if "no conversion was needed". However, I don't see anything anywhere that defines what it means for a conversion to be needed or not needed. I can think of several circumstances where one might plausibly think that a conversion is not "needed", but I don't know

which one is intended here.

Rationale:

Duplicate. See [issue 19](#).

12. Way objects hold allocators unclear

Section: 20.1.5 [lib allocator requirements](#) **Status:** [NAD](#) **Submitter:** Angelika Langer **Date:** 23 Feb 98

I couldn't find a statement in the standard saying whether the allocator object held by a container is held as a copy of the constructor argument or whether a pointer of reference is maintained internal. There is an according statement for compare objects and how they are maintained by the associative containers, but I couldn't find anything regarding allocators.

Did I overlook it? Is it an open issue or known defect? Or is it deliberately left unspecified?

Rationale:

Not a defect. The LWG believes that the Standard is already clear. See 23.1 paragraph 8 [[lib.container requirements](#)].

43. Locale table correction

Section: 22.2.1.5.2 [lib.locale.codecvt.virtuals](#) **Status:** [Dup](#) **Submitter:** Brendan Kehoe **Date:** 1 Jun 98

Rationale:

Duplicate. See [issue 33](#).

45. Stringstreams read/write pointers initial position unclear

Section: 27.7.3 [lib.ostringstream](#) **Status:** [NAD](#) **Submitter:** Matthias Mueller **Date:** 27 May 98

In a comp.lang.c++.moderated *Matthias Mueller wrote:*

"We are not sure how to interpret the CD2 (see [[lib.iostream.forward](#)], [[lib.ostringstream.cons](#)], [[lib.stringbuf.cons](#)]) with respect to the question as to what the correct initial positions of the write and read pointers of a stringstream should be."

"Is it the same to output two strings or to initialize the stringstream with the first and to output the second?"

PJ Plauger, Bjarne Stroustrup, Randy Smithey, Sean Corfield, and Jerry Schwarz have all offered opinions; see reflector messages lib-6518, 6519, 6520, 6521, 6523, 6524.

Rationale:

The LWG believes the Standard is correct as written. The behavior of stringstreams is consistent with fstreams, and there is a constructor which can be used to obtain the desired effect. This behavior is known to be different from strstreams.

58. Extracting a char from a wide-oriented stream

Section: 27.6.1.2.3 [lib.istream::extractors](#) **Status:** [NAD](#) **Submitter:** Matt Austern **Date:** 1 Jul 98

27.6.1.2.3 has member functions for extraction of signed char and unsigned char, both singly and as strings. However, it doesn't say what it means to extract a char from a `basic_streambuf<charT, Traits>`.

`basic_streambuf`, after all, has no members to extract a char, so `basic_istream` must somehow convert from `charT` to signed char or unsigned char. The standard doesn't say how it is to perform that conversion.

Rationale:

The Standard is correct as written. There is no such extractor and this is the intent of the LWG..

65. Underspecification of `strstreambuf::seekoff`

Section: D.7.1.3 [depr.strstreambuf.virtuals](#) **Status:** [NAD](#) **Submitter:** Matt Austern **Date:** 18 Aug 98

The standard says how this member function affects the current stream position. (`gptr` or `pptr`) However, it does not say how this member function affects the beginning and end of the get/put area.

This is an issue when `seekoff` is used to position the get pointer beyond the end of the current read area. (Which is legal. This is implicit in the definition of *seekhigh* in D.7.1, paragraph 4.)

Rationale:

The LWG agrees that `seekoff()` is underspecified, but does not wish to invest effort in this deprecated feature.

67. `setw` useless for strings

Section: 21.3.7.9 [lib.string.io](#) **Status:** [Dup](#) **Submitter:** Steve Clamage **Date:** 9 Jul 98

In a `comp.std.c++` posting *Michel Michaud* wrote: What should be output by :

```
string text("Hello");
cout << '[' << setw(10) << right << text << '']';
```

Shouldn't it be:

```
[      Hello]
```

Another person replied: Actually, according to the FDIS, the width of the field should be the minimum of width and the length of the string, so the output shouldn't have any padding. I think that this is a typo, however, and that what is wanted is the maximum of the two. (As written, `setw` is useless for strings. If that had been the intent, one wouldn't expect them to have mentioned using its value.)

It's worth pointing out that this is a recent correction anyway; IIRC, earlier versions of the draft forgot to mention formatting parameters what soever.

Rationale:

Duplicate. See [issue 25](#).

72. Do_convert phantom member function

Section: 22.2.1.5 [lib.locale.codecvt](#) **Status:** [Dup](#) **Submitter:** Nathan Myers **Date:** 24 Aug 98

In 22.2.1.5 par 3 [lib.locale.codecvt](#), and in 22.2.1.5.2 par 8 [lib.locale.codecvt.virtuals](#), a nonexistent member function "do_convert" is mentioned. This member was replaced with "do_in" and "do_out", the proper referents in the contexts above.

Proposed Resolution:

Duplicate: see [issue 24](#).

73. is_open should be const

Section: 27.8.1 [lib.file.streams](#) **Status:** [NAD](#) **Submitter:** Matt Austern **Date:** 27 Aug 98

Classes `basic_ifstream`, `basic_ofstream`, and `basic_fstream` all have a member function `is_open`. It should be a `const` member function, since it does nothing but call one of `basic_filebuf`'s `const` member functions.

Rationale:

Not a defect. This is a deliberate feature; `const` streams would be meaningless.

77. Valarray operator[] const returning value

Section: 26.3.2.3 [[lib.valarray.access](#)] **Status:** [NAD Future](#) **Submitter:** Levente Farkas **Date:** 9 Sep 98

valarray:

```
T operator[] (size_t) const;
```

why not

```
const T& operator[] (size_t) const;
```

as in vector ???

One can't copy even from a `const` valarray eg:

```
memcpy(ptr, &v[0], v.size() * sizeof(double));
```

[I] find this bug in valarray is very difficult.

Bjarne Stroustrup, lib-6597:

... I suspect that there ought to be a way of iterating over the elements on a valarray in the way Mr. Farkas suggests. The tricky issue is whether providing a way of obtaining a const pointer to an element of a const valarray would impede any of the optimizations for which valarray was defined.

Gabriel Dos Reis, lib-6599:

May I suggest

```
template<typename T>
class valarray {
    ...
    typename "implementation defined" const_iterator;
    ...
};
```

and specify that a valarray<>::const_iterator may be aggressively optimized?

Bjarne Stroustrup, lib-6604:

We don't have ... iterator types and ... begin()/end() members. They would be easy to add (had the committee been in it's pre-CD2 mode of operations), but would adding them have endangered critical optimizations?

Greg Colvin, lib-6605:

If we decide to fix this I would prefer changing

```
T operator[](size_t) const;
T& operator[](size_t);
```

to

```
const T& operator[](size_t) const;
T& operator[](size_t);
```

rather than trying at this late date to make an STL container out of valarray.

Rationale:

The LWG believes that the interface was deliberately designed that way. That is what valarray was designed to do; that's where the "value array" name comes from. LWG members further comment that "we don't want valarray to be a full STL container." 26.3.2.3 [lib.valarray.access](#) specifies properties that indicate "an absence of aliasing" for non-constant arrays; this allows optimizations, including special hardware optimizations, that are not otherwise possible.⁸⁰ Global Operators of complex declared twice

81. Wrong declaration of slice operations

Section: 26.3.5 [lib.template.slice.array](#), 26.3.7 [lib.template.gslicing.array](#), 26.3.8, 26.3.9 **Status:** [NAD](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

Isn't the definition of copy constructor and assignment operators wrong? Instead of

```
slice_array(const slice_array&);
slice_array& operator=(const slice_array&);
```

IMHO they have to be

```
slice_array(const slice_array<T>&);
slice_array& operator=(const slice_array<T>&);
```

Same for `gslice_array`.

Rationale:

Not a defect. The Standard is correct as written.

82. Missing constant for set elements

Section: 23.1.2 [lib.associative.reqmts](#) **Status:** [NAD](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

Paragraph 5 specifies:

For set and multiset the value type is the same as the key type. For map and multimap it is equal to `pair<const Key, T>`.

Strictly speaking, this is not correct because for set and multiset the value type is the same as the **constant** key type.

Rationale:

Not a defect. The Standard is correct as written; it uses a different mechanism (`const &`) for `set` and `multiset`. See issue [103](#) for a related issue.

84. Ambiguity with `string::insert()`

Section: 21.3.5 [lib.string.modifiers](#) **Status:** [NAD Future](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

If I try

```
s.insert(0,1,' ');
```

I get an nasty ambiguity. It might be

```
s.insert((size_type)0,(size_type)1,(charT)' ');
```

which inserts 1 space character at position 0, or

```
s.insert((char*)0,(size_type)1,(charT)' ');
```

which inserts 1 space character at iterator/address 0 (bingo!), or

```
s.insert((char*)0, (InputIterator)1, (InputIterator)' ');
```

which normally inserts characters from iterator 1 to iterator `' '`. But according to 23.1.1.9 (the "do the right thing" fix) it is equivalent to the second. However, it is still ambiguous, because of course I mean the first!

Rationale:

Not a defect. The LWG believes this is a "genetic misfortune" inherent in the design of string and thus not a defect in the Standard as such .

85. String char types

Section: 21 [lib.strings](#) **Status:** [NAD](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

The standard seems not to require that charT is equivalent to traits::char_type. So, what happens if charT is not equivalent to traits::char_type ?

Rationale:

There is already wording in 21.1 paragraph 3 ([lib.char.traits](#)) that requires them to be the same.

87. Error in description of string::compare()

Section: 21.3.6.8 [lib.string::compare](#) **Status:** [Dup](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

The following compare() description is obviously a bug:

```
int compare(size_type pos, size_type n1,
            charT *s, size_type n2 = npos) const;
```

because without passing n2 it should compare up to the end of the string instead of comparing npos characters (which throws an exception)

Rationale:

Duplicate; see [issue 5](#).

88. Inconsistency between string::insert() and string::append()

Section: 21.3.5.4 [lib.string::insert](#), 21.3.5.2 [lib.string::append](#) **Status:** [NAD Future](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

Why does

```
template<class InputIterator>
    basic_string& append(InputIterator first, InputIterator last);
```

return a string, while

```
template<class InputIterator>
    void insert(iterator p, InputIterator first, InputIterator last);
```

returns nothing ?

Rationale:

The LWG believes this inconsistency is not sufficiently serious to constitute a defect.

89. Missing throw specification for `string::insert()` and `string::replace()`

Section: 21.3.5.4 [lib.string::insert](#), 21.3.5.6 [lib.string::replace](#) **Status:** [Dup](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

All `insert()` and `replace()` members for strings with an iterator as first argument lack a throw specification. The throw specification should probably be: `length_error` if size exceeds maximum.

Rationale:

Considered a duplicate because it will be solved by the resolution of [issue 83](#).

93. Incomplete Valarray Subset Definitions

Section: 26.3 [lib.numarray](#) **Status:** [NAD Future](#) **Submitter:** Nico Josuttis **Date:** 29 Sep 98

You can easily create subsets, but you can't easily combine them with other subsets. Unfortunately, you almost always need an explicit type conversion to valarray. This is because the standard does not specify that valarray subsets provide the same operations as valarrays.

For example, to multiply two subsets and assign the result to a third subset, you can't write the following:

```
va[slice(0,4,3)] = va[slice(1,4,3)] * va[slice(2,4,3)];
```

Instead, you have to code as follows:

```
va[slice(0,4,3)] = static_cast<valarray<double>> >(va[slice(1,4,3)]) *  
                  static_cast<valarray<double>> >(va[slice(2,4,3)]);
```

This is tedious and error-prone. Even worse, it costs performance because each cast creates a temporary object, which could be avoided without the cast.

Proposed resolution:

Extend all valarray subset types so that they offer all valarray operations.

Rationale:

This is not a defect in the Standard; it is a request for an extension.

95. Members added by the implementation

Section: 17.4.4.4 [lib.member.functions](#) **Status:** [NAD](#) **Submitter:** AFNOR **Date:** 7 Oct 98

In 17.3.4.4/2 vs 17.3.4.7/0 there is a hole; an implementation could add virtual members to a base class and break user

derived classes.

Example:

```
// implementation code:
struct _Base { // _Base is in the implementer namespace
    virtual void foo ();
};
class vector : _Base // deriving from a class is allowed
{ ... };

// user code:
class vector_checking : public vector
{
    void foo (); // don't want to override _Base::foo () as the
                // user doesn't know about _Base::foo ()
};
```

Proposed Resolution:

Clarify the wording to make the example illegal.

Rationale:

This is not a defect in the Standard. The example is already illegal. See 17.4.4.4 [lib.member.functions](#) paragraph 2.

97. Insert inconsistent definition

Section: 23 [lib.containers](#) **Status:** [NAD Future](#) **Submitter:** AFNOR **Date:** 7 Oct 98

`insert(iterator, const value_type&)` is defined both on sequences and on set, with unrelated semantics: `insert` here (in sequences), and `insert with hint` (in associative containers). They should have different names (B.S. says: do not abuse overloading).

Rationale:

This is not a defect in the Standard. It is a genetic misfortune of the design, for better or for worse.

99. Reverse_iterator comparisons completely wrong

Section: 24.4.1.3.13 [lib.reverse.iter.op<](#), etc. **Status:** [NAD](#) **Submitter:** AFNOR **Date:** 7 Oct 98

The `<`, `>`, `<=`, `>=` comparison operators are wrong: they return the opposite of what they should.

Note: same problem in CD2, these were not even defined in CD1

SGI STL code is correct; this problem is known since the Morristown meeting but there it was too late

Rationale:

This is not a defect in the Standard. A careful reading shows the Standard is correct as written. *A careful reading of the SGI implementation shows that it implements exactly what the Standard says.*

100. Insert iterators/ostream_iterators overconstrained

Section: 24.4.2 [lib.insert.iterators](#), 24.5.4 [lib.ostreambuf.iterator](#) **Status:** [NAD](#) **Submitter:** AFNOR **Date:** 7 Oct 98

Overspecified For an insert iterator it, the expression *it is required to return a reference to it. This is a simple possible implementation, but as the SGI STL documentation says, not the only one, and the user should not assume that this is the case.

Rationale:

The LWG believes this causes no harm and is not a defect in the standard.

[In Santa Cruz: the LWG agrees in principle, but couldn't think of any practical problem this would cause. AFNOR was asked to provide a practical example.]

In Dublin, Valentin Bonnard presented the issue, but the only example anyone could come up with caused some incorrect code to work, rather than the other way around.]

101. No way to free storage for vector and deque

Section: 23.2.4 [lib.vector](#), 23.2.1 [lib.deque](#) **Status:** [NAD](#) **Submitter:** AFNOR **Date:** 7 Oct 98

Reserve can not free storage, unlike string::reserve

Rationale:

This is not a defect in the Standard. The LWG has considered this issue in the past and sees no need to change the Standard. Deque has no reserve() member function. For vector, shrink-to-fit can be expressed in a single line of code (where v is vector<T>):

```
vector<T>(v).swap(v); // shrink-to-fit v
```

104. Description of basic_string::operator[] is unclear

Section: 21.3.4 [lib.string.access](#) **Status:** [NAD](#) **Submitter:** AFNOR **Date:** 7 Oct 98

It is not clear that undefined behavior applies when pos == size () for the non const version.

Proposed Resolution:

Rewrite as: Otherwise, if pos > size () or pos == size () and the non-const version is used, then the behavior is undefined.

Rationale:

The Standard is correct. The proposed resolution already appears in the Standard.

105. fstream ctors argument types desired

Section: 27.8 [lib.file.streams](#) **Status:** [NAD Future](#) **Submitter:** AFNOR **Date:** 7 Oct 98

fstream ctors take a const char* instead of string.
fstream ctors can't take wchar_t

An extension to add a const wchar_t* to fstream would make the implementation non conforming.

Rationale:

This is not a defect in the Standard. It might be an interesting extension for the next Standard.

107. Valarray constructor is strange

Section: 26.3.2 [lib.template.valarray](#) **Status:** [NAD](#) **Submitter:** AFNOR **Date:** 7 Oct 98

The order of the arguments is (elem, size) instead of the normal (size, elem) in the rest of the library. Since elem often has an integral or floating point type, both types are convertible to each other and reversing them leads to a well formed program.

Proposed Resolution:

Inverting the arguments could silently break programs. Introduce the two signatures (const T&, size_t) and (size_t, const T&), but make the one we do not want private so errors result in a diagnosed access violation. This technique can also be applied to STL containers.

[Santa Cruz: The LWG believes, that the proposed solution will not work for valarray<size_t> and perhaps other cases.]

Rationale:

The LWG believes that while the order of arguments is unfortunate, it does not constitute a defect in the standard.

113. Missing/extra iostream sync semantics

Section: 27.6.1.1 [lib.istream](#), 27.6.1.3 [lib.istream.unformatted](#), para 36 **Status:** [NAD](#) **Submitter:** Steve Clamage
Date: 13 Oct 98

In 27.6.1.1, class basic_istream has a member function sync, described in 27.6.1.3, paragraph 36.

Following the chain of definitions, I find that the various sync functions have defined semantics for output streams, but no semantics for input streams. On the other hand, basic_ostream has no sync function.

The sync function should at minimum be added to basic_ostream, for internal consistency.

A larger question is whether sync should have assigned semantics for input streams.

Classic iostreams said streambuf::sync flushes pending output and attempts to return unread input characters to the

source. It is a protected member function. The filebuf version (which is public) has that behavior (it backs up the read pointer). Class `strstreambuf` does not override `streambuf::sync`, and so `sync` can't be called on a `strstream`.

If we can add corresponding semantics to the various sync functions, we should. If not, we should remove sync from `basic_istream`.

Rationale:

A sync function is not needed in `basic_ostream` because the flush function provides the desired functionality.

As for the other points, the LWG finds the standard correct as written.

[Dublin: the LWG discussed this issue in considerable detail.]

116. bitset cannot be constructed with a const char*

Section: 23.3.5 [lib.template.bitset](#) **Status:** [NAD Future](#) **Submitter:** Judy Ward **Date:** 6 Nov 1998

The following code does not compile *with the EDG compiler*:

```
#include <bitset>
using namespace std;
bitset<32> b("11111111");
```

If you cast the ctor argument to a string, i.e.:

```
bitset<32> b(string("11111111"));
```

then it will compile. The reason is that `bitset` has the following templized constructor:

```
template <class charT, class traits, class Allocator>
explicit bitset (const basic_string<charT, traits, Allocator>& str, ...);
```

According to the compiler vendor, *Steve Adamcyk at EDG*, the user cannot pass this template constructor a `const char*` and expect a conversion to `basic_string`. The reason is "When you have a template constructor, it can get used in contexts where type deduction can be done. Type deduction basically comes up with exact matches, not ones involving conversions."

I don't think the intention when this constructor became templized was for construction from a `const char*` to no longer work.

Proposed Resolution:

Add to 23.3.5 [lib.template.bitset](#) a `bitset` constructor declaration

```
explicit bitset(const char*);
```

and in Section 23.3.5.1 [lib.bitset.cons](#) add:

```
explicit bitset(const char* str);
```

Effects:

```
Calls bitset((string) str, 0, string::npos);
```

Rationale:

Although the problem is real, the standard is designed that way so it is not a defect. Education is the immediate workaround. A future standard may wish to consider the Proposed Resolution as an extension.

[Discussed in Dublin.]

128. Need `open_mode()` function for file stream, string streams, file buffers, and string buffers

Section: 27.7 [lib.string.streams](#) and 27.8 [lib.file.streams](#) **Status:** [NAD Future](#) **Submitter:** Angelika Langer **Date:** February 22, 1999

The following question came from Thorsten Herlemann:

You can set a mode when constructing or opening a file-stream or filebuf, e.g. `ios::in`, `ios::out`, `ios::binary`, ... But how can I get that mode later on, e.g. in my own operator `<<` or operator `>>` or when I want to check whether a file-stream or file-buffer object passed as parameter is opened for input or output or binary? Is there no possibility? Is this a design-error in the standard C++ library?

It is indeed impossible to find out what a stream's or stream buffer's open mode is, and without that knowledge you don't know how certain operations behave. Just think of the append mode.

Both streams and stream buffers should have a `mode()` function that returns the current open mode setting.

Proposed Resolution:

For stream buffers, add a function to the base class as a non-virtual function qualified as `const` to 27.5.2 [lib.streambuf](#)

```
openmode mode() const;
```

Returns the current open mode.

With streams, I'm not sure what to suggest. In principle, the mode could already be returned by `ios_base`, but the mode is only initialized for file and string stream objects, unless I'm overlooking anything. For this reason it should be added to the most derived stream classes. Alternatively, it could be added to `basic_ios` and would be default initialized in `basic_ios<>::init()`.

Rationale:

This might be an interesting extension for some future, but it is not a defect in the current standard. The Proposed Resolution is retained for future reference.

130. Return type of `container::erase(iterator)` differs for associative containers

Section: 23.1.2 [lib.associative.reqmts](#), 23.1.1 [lib.sequence.reqmts](#) **Status:** [NAD Future](#) **Submitter:** Andrew Koenig **Date:** 2 Mar 99

Table 67 (23.1.1) says that `container::erase(iterator)` returns an iterator. Table 69 (23.1.2) says that in addition to this requirement, associative containers also say that `container::erase(iterator)` returns void.

That's not an addition; it's a change to the requirements, which has the effect of making associative containers fail to meet the requirements for containers.

Rationale:

The LWG believes this was an explicit design decision by Alex Stepanov driven by complexity considerations. It has been previously discussed and reaffirmed, so this is not a defect in the current standard. A future standard may wish to reconsider this issue.

131. `list::splice` throws nothing

Section: 23.2.2.4 [lib.list.ops](#) **Status:** [NAD](#) **Submitter:** Howard Hinnant **Date:** 6 Mar 99

What happens if a splice operation causes the `size()` of a list to grow beyond `max_size()`?

Rationale:

`Size()` cannot grow beyond `max_size()`.

135. `basic_istream` doubly initialized

Section: 27.6.1.5.1 [lib.istream.cons](#) **Status:** [NAD](#) **Submitter:** Howard Hinnant **Date:** 6 Mar 99

-1- Effects Constructs an object of class `basic_istream`, assigning initial values to the base classes by calling `basic_istream<charT,traits>(sb)` (`lib.istream`) and `basic_ostream<charT,traits>(sb)` (`lib.ostream`)

The called for `basic_istream` and `basic_ostream` constructors call `init(sb)`. This means that the `basic_istream`'s virtual base class is initialized twice.

Proposed Resolution:

Change 27.6.1.5.1, paragraph 1 to:

-1- Effects Constructs an object of class `basic_istream`, assigning initial values to the base classes by calling `basic_istream<charT,traits>(sb)` (`lib.istream`).

Rationale:

The LWG agreed that the `init()` function is called twice, but said that this is harmless and so not a defect in the standard.

140. `map<Key, T>::value_type` does not satisfy the assignable requirement

Section: 23.3.1 [lib.map](#) **Status:** [NAD Future](#) **Submitter:** Mark Mitchell **Date:** 14 Apr 99

[\[lib.container.requirements\]](#)

expression	return type	pre/post-condition
-----	-----	-----

`X::value_type T` `T` is assignable

[[lib.map](#)]

A map satisfies all the requirements of a container.

For a `map<Key, T>` ... the `value_type` is `pair<const Key, T>`.

There's a contradiction here. In particular, `pair<const Key, T>` is not assignable; the `const Key` cannot be assigned to. So, `map<Key, T>::value_type` does not satisfy the assignable requirement imposed by a container.

[See [103](#) for the slightly related issue of modification of set keys]

In lib-6855 Nicolai Josuttis comments: There is an interesting general issue involved here. IMO we don't need the requirement that elements are assignable for any node based container type (i.e. neither for lists nor for all associative containers). Copyable and destroyable would be enough.

In lib-6856 Howard Hinnant comments: I'm not comfortable lumping list into this category. I think it is a quite reasonable design decision for `list::assign` to use `T`'s assignment operator to recycle nodes. One could argue that a destruction / placement new sequence could be used to replace assignment and thus you could still recycle nodes, but where's the win?

Rationale:

The LWG believes that the standard is inconsistent, but that this is a design problem rather than a strict defect. May wish to reconsider for the next standard.

145. adjustfield lacks default value

Section: 27.4.4.1 [lib.basic.ios.cons](#) **Status:** [NAD](#) **Submitter:** Angelika Langer **Date:** 12 May 99

There is no initial value for the `adjustfield` defined, although many people believe that the default adjustment were right. This is a common misunderstanding. The standard only defines that, if no adjustment is specified, all the predefined inserters must add fill characters before the actual value, which is "as if" the right flag were set. The flag itself need not be set.

When you implement a user-defined inserter you cannot rely on right being the default setting for the `adjustfield`. Instead, you must be prepared to find none of the flags set and must keep in mind that in this case you should make your inserter behave "as if" the right flag were set. This is surprising to many people and complicates matters more than necessary.

Unless there is a good reason why the `adjustfield` should not be initialized I would suggest to give it the default value that everybody expects anyway.

Rationale:

This is not a defect. It is deliberate that the default is no bits set. Consider Arabic or Hebrew, for example. See 22.2.2.2.2 [\[lib.facet.num.put.virtuals\]](#) paragraph 19, Table 61 - Fill padding.

149. Insert should return iterator to first element inserted

Section: 23.1.1 [lib.sequence.reqmts](#) **Status:** [NAD Future](#) **Submitter:** Andrew Koenig **Date:** 28 Jun 99

Suppose that `c` and `c1` are sequential containers and `i` is an iterator that refers to an element of `c`. Then I can insert a copy of `c1`'s elements into `c` ahead of element `i` by executing

```
c.insert(i, c1.begin(), c1.end());
```

If `c` is a vector, it is fairly easy for me to find out where the newly inserted elements are, even though `i` is now invalid:

```
size_t i_loc = i - c.begin();
c.insert(i, c1.begin(), c1.end());
```

and now the first inserted element is at `c.begin()+i_loc` and one past the last is at `c.begin()+i_loc+c1.size()`.

But what if `c` is a list? I can still find the location of one past the last inserted element, because `i` is still valid. To find the location of the first inserted element, though, I must execute something like

```
for (size_t n = c1.size(); n; --n)
    --i;
```

because `i` is now no longer a random-access iterator.

Alternatively, I might write something like

```
bool first = i == c.begin();
list<T>::iterator j = i;
if (!first) --j;
c.insert(i, c1.begin(), c1.end());
if (first)
    j = c.begin();
else
    ++j;
```

which, although wretched, requires less overhead.

But I think the right solution is to change the definition of `insert` so that instead of returning `void`, it returns an iterator that refers to the first element inserted, if any, and otherwise is a copy of its first argument.

Rationale:

The LWG believes this was an intentional design decision and so is not a defect. It may be worth revisiting for the next standard.

157. Meaningless error handling for `pword()` and `word()`

Section:: 27.4.2.5 [lib.ios.base.storage](#) **Status:** [Dup](#) **Submitter:** Dietmar Kühl **Date:** 20 Jul 99

According to paragraphs 2 and 4 of 27.4.2.5 ([lib.ios.base.storage](#)), the functions `word()` and `pword()` "set the `badbit` (which might throw an exception)" on failure. ... but what does it mean for `ios_base` to set the `badbit`? The state facilities of the `IOStream` library are defined in `basic_ios`, a derived class! It would be possible to attempt a down cast but then it would be necessary to know the character type used...

Rationale:

Duplicate. See issue [41](#).

162. Really "formatted input functions"?

Section:: 27.6.1.2.3 [lib.istream::extractors](#) **Status:** [Dup](#) **Submitter:** Dietmar Kühl **Date:** 20 Jul 99

It appears to be somewhat nonsensical to consider the functions defined in the paragraphs 1 to 5 to be "Formatted input function" but since these functions are defined in a section labeled "Formatted input functions" it is unclear to me whether these operators are considered formatted input functions which have to conform to the "common requirements" from 27.6.1.2.1 ([lib.istream.formatted.reqmts](#)): If this is the case, all manipulators, not just `ws`, would skip whitespace unless `noskipws` is set (... but setting `noskipws` using the manipulator syntax would also skip whitespace :-)

See also below for the same problem is [formatted output](#)

Rationale:

Duplicate. See issue [60](#).

163. Return of `gcount()` after a call to `gcount`

Section:: 27.6.1.3 [lib.istream.unformatted](#) **Status:** [Dup](#) **Submitter:** Dietmar Kühl **Date:** 20 Jul 99

It is not clear which functions are to be considered unformatted input functions. As written, it seems that all functions in 27.6.1.3 ([lib.istream.unformatted](#)) are unformatted input functions. However, it does not really make much sense to construct a sentry object for `gcount()`, `sync()`, ... Also it is unclear what happens to the `gcount()` if eg. `gcount()`, `putback()`, `unget()`, or `sync()` is called: These functions don't extract characters, some of them even "unextract" a character. Should this still be reflected in `gcount()`? Of course, it could be read as if after a call to `gcount()` `gcount()` return 0 (the last unformatted input function, `gcount()`, didn't extract any character) and after a call to `putback()` `gcount()` returns -1 (the last unformatted input function `putback()` did "extract" back into the stream). Correspondingly for `unget()`. Is this what is intended? If so, this should be clarified. Otherwise, a corresponding clarification should be used.

Rationale:

Duplicate. See issue [60](#).

166. Really "formatted output functions"?

Section:: 27.6.2.5.3 [lib.ostream.inserters](#) **Status:** [Dup](#) **Submitter:** Dietmar Kühl **Date:** 20 Jul 99

From 27.6.2.5.1 ([lib.ostream.formatted.reqmts](#)) it appears that all the functions defined in 27.6.2.5.3 ([lib.ostream.inserters](#)) have to construct a `sentry` object. Is this really intended?

This is basically the same problem as the corresponding defect report for [formatted input](#) but for output instead of input.

Rationale:

Duplicate. See issue [60](#).

178. Should `clog` and `cerr` initially be tied to `cout`?

Section: 27.3.1 [lib.narrow.stream.objects](#) **Status:** [NAD](#) **Submitter:** Judy Ward **Date:** 2 Jul 99

Section 27.3.1 says "After the object cerr is initialized, cerr.flags() & unitbuf is nonzero. Its state is otherwise the same as required for ios_base::init (lib.basic.ios.cons). It doesn't say anything about the the state of clog. So this means that calling cerr.tie() and clog.tie() should return 0 (see Table 89 for ios_base::init effects).

Neither of the popular standard library implementations that I tried does this, they both tie cerr and clog to &cout. I would think that would be what users expect.

Rationale:

The standard is clear as written.

188. valarray helpers missing augmented assignment operators

Section: 26.3.2.6 [lib.valarray.cassign](#) **Status:** [NAD Future](#) **Submitter:** Gabriel Dos Reis **Date:** 15 Aug 99

26.3.2.6 defines augmented assignment operators valarray<T>::op=(const T&), but fails to provide corresponding versions for the helper classes. Thus making the following illegal:

```
#include <valarray>

int main()
{
    std::valarray<double> v(3.14, 1999);

    v[99] *= 2.0; // Ok

    std::slice s(0, 50, 2);

    v[s] *= 2.0; // ERROR
}
```

I can't understand the intent of that omission. It makes the valarray library less intuitive and less useful.

Rationale:

Although perhaps an unfortunate design decision, the omission is not a defect in the current standard. A future standard may wish to add the missing operators.

190. min() and max() functions should be std::binary_functions

Section: 25.3.7 [lib.alg.min.max](#) **Status:** [NAD Future](#) **Submitter:** Mark Rintoul **Date:** 26 Aug 99

Both std::min and std::max are defined as template functions. This is very different than the definition of std::plus (and similar structs) which are defined as function objects which inherit std::binary_function.

This lack of inheritance leaves std::min and std::max somewhat useless in standard library algorithms which require a function object that inherits std::binary_function.

Rationale:

Although perhaps an unfortunate design decision, the omission is not a defect in the current standard. A future standard may wish to consider additional function objects.

191. Unclear complexity for algorithms such as binary search

Section: 25.3.3 [lib.alg.binary.search](#) **Status:** [NAD](#) **Submitter:** Nico Josuttis **Date:** 10 Oct 99

The complexity of `binary_search()` is stated as "At most $\log(\text{last-first}) + 2$ comparisons", which seems to say that the algorithm has logarithmic complexity. However, this algorithm is defined for forward iterators. And for forward iterators, the need to step element-by-element results into linear complexity. But such a statement is missing in the standard. The same applies to `lower_bound()`, `upper_bound()`, and `equal_range()`.

However, strictly speaking the standard contains no bug here. So this might be considered to be a clarification or improvement.

Rationale:

The complexity is expressed in terms of comparisons, and that complexity can be met even if the number of iterators accessed is linear. Paragraph 1 already says exactly what happens to iterators.

192. `a.insert(p,t)` is inefficient and overconstrained

Section: 23.1.2 [lib.associative.reqmts](#) **Status:** [NAD Future](#) **Submitter:** Ed Brey **Date:** 6 Jun 99

As defined in 23.1.2, paragraph 7 (table 69), `a.insert(p,t)` suffers from several problems:

expression	return type	pre/post-condition	complexity
<code>a.insert(p,t)</code>	iterator	inserts <code>t</code> if and only if there is no element with key equivalent to the key of <code>t</code> in containers with unique keys; always inserts <code>t</code> in containers with equivalent keys. always returns the iterator pointing to the element with key equivalent to the key of <code>t</code> . iterator <code>p</code> is a hint pointing to where the insert should start to search.	logarithmic in general, but amortized constant if <code>t</code> is inserted right after <code>p</code> .

1. For a container with unique keys, only logarithmic complexity is guaranteed if no element is inserted, even though constant complexity is always possible if `p` points to an element equivalent to `t`.
2. For a container with equivalent keys, the amortized constant complexity guarantee is only useful if no key equivalent to `t` exists in the container. Otherwise, the insertion could occur in one of multiple locations, at least one of which would not be right after `p`.
3. By guaranteeing amortized constant complexity only when `t` is inserted after `p`, it is impossible to guarantee constant complexity if `t` is inserted at the beginning of the container. Such a problem would not exist if amortized constant complexity was guaranteed if `t` is inserted before `p`, since there is always some `p` immediately before which an insert can take place.
4. For a container with equivalent keys, `p` does not allow specification of where to insert the element, but rather only acts as a hint for improving performance. This negates the added functionality that `p` would provide if it specified where

within a sequence of equivalent keys the insertion should occur. Specifying the insert location provides more control to the user, while providing no disadvantage to the container implementation.

Proposed Resolution:

In 23.1.2 [lib.associative.reqmts](#) paragraph 7, replace the row in table 69 for `a.insert(p,t)` with the following two rows:

expression	return type	pre/post-condition	complexity
<code>a_uniq.insert(p,t)</code>	iterator	inserts <code>t</code> if and only if there is no element with key equivalent to the key of <code>t</code> . returns the iterator pointing to the element with key equivalent to the key of <code>t</code> .	logarithmic in general, but amortized constant if <code>t</code> is inserted right before <code>p</code> or <code>p</code> points to an element with key equivalent to <code>t</code> .
<code>a_eq.insert(p,t)</code>	iterator	inserts <code>t</code> and returns the iterator pointing to the newly inserted element. <code>t</code> is inserted right before <code>p</code> if doing so preserves the container ordering.	logarithmic in general, but amortized constant if <code>t</code> is inserted right before <code>p</code> .

Rationale:

Too big a change. Furthermore, implementors report checking both before `p` and after `p`, and don't want to change this behavior.

194. rdbuf() functions poorly specified

Section: 27.4.4 [lib.ios](#) **Status:** [NAD](#) **Submitter:** Steve Clamage **Date:** 7 Sep 99

In classic iostreams, base class `ios` had an `rdbuf` function that returned a pointer to the associated streambuf. Each derived class had its own `rdbuf` function that returned a pointer of a type reflecting the actual type derived from streambuf. Because in ARM C++, virtual function overrides had to have the same return type, `rdbuf` could not be virtual.

In standard iostreams, we retain the non-virtual `rdbuf` function design, and in addition have an overloaded `rdbuf` function that sets the buffer pointer. There is no need for the second function to be virtual nor to be implemented in derived classes.

Minor question: Was there a specific reason not to make the original `rdbuf` function virtual?

Major problem: Friendly compilers warn about functions in derived classes that hide base-class overloads. Any standard implementation of iostreams will result in such a warning on each of the iostream classes, because of the ill-considered decision to overload `rdbuf` only in a base class.

In addition, users of the second `rdbuf` function must use explicit qualification or a cast to call it from derived classes. An explicit qualification or cast to `basic_ios` would prevent access to any later overriding version if there was one.

What I'd like to do in an implementation is add a using- declaration for the second `rdbuf` function in each derived class. It would eliminate warnings about hiding functions, and would enable access without using explicit qualification. Such a change I don't think would change the behavior of any valid program, but would allow invalid programs to compile:

```
filebuf mybuf;
fstream f;
f.rdbuf(mybuf); // should be an error, no visible rdbuf
```

I'd like to suggest this problem as a defect, with the proposed resolution to require the equivalent of a using-declaration for the `rdbuf` function that is not replaced in a later derived class. We could discuss whether replacing the function should be allowed.

Rationale:

For historical reasons, the standard is correct as written. There is a subtle difference between the base class `rdbuf()` and derived class `rdbuf()`. The derived class `rdbuf()` always returns the original streambuf, whereas the base class `rdbuf()` will return the "current streambuf" if that has been changed by the variant you mention.

Permission is not required to add such an extension. See 17.4.4.4 [[lib.member.functions](#)].

----- End of document -----