

Blanket Wording for Specifying “Hidden Friends”

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Abstract

[P1601R0] provided wording guidance for the specification of a *hidden friend*, a function or function template that is declared a **friend** of a class or class template such that only argument-dependent lookup can find its declaration. That guidance recommended that a carefully-worded *Remarks:* element become part of the specification of each hidden friend entity throughout the standard library “[u]nless made unnecessary by pre-existing blanket wording to the same effect.”

This paper proposes such blanket wording so that no individual *Remarks:* elements need be provided for the stated purpose.

A friend to all is a friend to none.
— ARISTOTLE

Friends are the siblings God never gave us.
— MENCIOUS

1 Introduction

[P1601R0] provided wording guidance for the specification of a *hidden friend*, a function or function template that is declared a **friend** of a class or class template such that only argument-dependent lookup can find its declaration. That guidance recommended that a carefully-worded *Remarks:* element become part of the specification of each hidden friend entity throughout the standard library “[u]nless made unnecessary by pre-existing blanket wording to the same effect.”

This paper proposes such blanket wording so that no individual *Remarks:* elements need be provided for the stated purpose. If adopted, the proposed wording would resolve LWG issue 3239, *Hidden friends should be specified more narrowly*, thereby addressing NB comment DE165, *Regular unqualified lookup of functions specified as friends*.

2 Affected declarations

For reference, adoption of the blanket wording proposed below will impact friend declarations found in each of the following subclasses of [N4835]:

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[cmp.weakq]	[counted.iterator]	[range.join.iterator]
[cmp.strongeq]	[unreachable.sentinel]	[range.join.sentinel]
[cmp.partialord]	[istream.iterator]	[range.split.outer]
[cmp.weakord]	[istreambuf.iterator]	[range.split.inner]
[cmp.strongord]	[range.subrange]	[range.istream.iterator]
[pairs.pair]	[range.empty.view]	[range.elements.iterator]
[charconv.syn]	[range.iota.iterator]	[class.slice.overview]
[format.arg]	[range.ref.view]	[fs.filesystem.syn]
[string.view.template]	[range.filter.iterator]	[fs.class.path]
[container.node.overview]	[range.filter.sentinel]	[fs.path.io]
[span.overview]	[range.transform.iterator]	[fs.class.file.status]
[reverse.iterator]	[range.transform.sentinel]	[stoptoken]
[move.iterator]	[range.take.sentinel]	[stopsource]
[common.iterator]	[range.take.while.sentinel]	[thread.jthread.class]

3 Proposed wording¹

3.1 Insert the following new subclause into clause [conforming], either between existing subclauses [member functions] and [constexpr.functions] or nearby at the discretion of the Project Editor:

16.5.5.n Friend functions

[hidden.friends]

1 Whenever this document specifies a friend declaration of a function or function template within a class or class template definition, that declaration shall be the only declaration of that function or function template provided by an implementation. [Note: In particular, an implementation is not allowed to provide an additional declaration of that function or function template at namespace scope. — end note] [Note: Such a friend function or function template declaration is known as a *hidden friend*, as it is visible neither to ordinary unqualified lookup ([basic.lookup.unqual]) nor to qualified lookup ([basic.lookup.qual]). — end note]

4 Bibliography

- [N4835] Richard Smith: “Working Draft, Standard for Programming Language C++.” ISO/IEC JTC1/SC22/WG21 document N4835 (pre-Belfast mailing), 2019–10–08. <https://wg21.link/n4835>.
- [P1601R0] Walter E. Brown and Daniel Sunderland: “Recommendations for Specifying ‘Hidden Friends’.” ISO/IEC JTC1/SC22/WG21 document P1601R0 (post-Kona mailing), 2019–03–10. <https://wg21.link/p1601r0>.

5 Document history

Rev.	Date	Changes
0	2019–11–06	• Published as P1965R0, post-Belfast mailing.

¹Proposed [additions](#) are based on [N4835]. Editorial instructions and drafting notes look like [this](#).