Iterator Archetype

Abstract: The iterator_archetype class constructs a minimal implementation of one of the iterator access concepts and one of the iterator traversal concepts. This is used for doing a compile-time check to see if the type requirements of a template are really enough to cover the implementation of the template. For further information see the documentation for the boost::concept_check library.

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Reference

iterator_archetype Synopsis

namespace iterator_archetypes
{
    // Access categories

typedef /*implementation defined*/ readable_iterator_t;
typedef /*implementation defined*/ writable_iterator_t;
typedef /*implementation defined*/ readable_writable_iterator_t;
typedef /*implementation defined*/ readable_lvalue_iterator_t;
typedef /*implementation defined*/ writable_lvalue_iterator_t;
}

template <
    class Value,
    class AccessCategory

class iterator_archetype
{
    typedef /* see below */ value_type;
    typedef /* see below */ reference;
    typedef /* see below */ pointer;
    typedef /* see below */ difference_type;
    typedef /* see below */ iterator_category;
};

Access Category Tags

The access category types provided correspond to the following standard iterator access concept combinations:

readable_iterator_t :=
    Readable Iterator

writable_iterator_t :=
    Writeable Iterator

readable_writable_iterator_t :=
    Readable Iterator & Writeable Iterator & Swappable Iterator

readable_lvalue_iterator_t :=
    Readable Iterator & Lvalue Iterator

writeable_lvalue_iterator_t :=
    Readable Iterator & Writeable Iterator & Swappable Iterator & Lvalue Iterator

iterator_archetype Requirements

The AccessCategory argument must be one of the predefined access category tags. The TraversalCategory must be one of the standard traversal tags. The Value type must satisfy the requirements of the iterator concept specified by AccessCategory and TraversalCategory as implied by the nested traits types.

iterator_archetype Models

iterator_archetype models the iterator concepts specified by the AccessCategory and TraversalCategory arguments. iterator_archetype does not model any other access concepts or any more derived traversal concepts.
Traits

The nested trait types are defined as follows:

if (AccessCategory == readable_iterator_t)
    value_type = Value
    reference = Value
    pointer = Value*
else if (AccessCategory == writable_iterator_t)
    value_type = void
    reference = void
    pointer = void
else if (AccessCategory == readable_writable_iterator_t)
    value_type = Value
    reference :=
      A type X that is convertible to Value for which the following expression is valid. Given an object x of type X and v of type Value.
      x = v
    pointer = Value*
else if (AccessCategory == readable_lvalue_iterator_t)
    value_type = Value
    reference = Value const&
    pointer = Value const*
else if (AccessCategory == writable_lvalue_iterator_t)
    value_type = Value
    reference = Value&
    pointer = Value*

if (TraversalCategory is convertible to forward_traversal_tag)
    difference_type := ptrdiff_t
else
    difference_type := unspecified type

iterator_category :=
A type X satisfying the following two constraints:
1. X is convertible to X1, and not to any more-derived type, where X1 is defined by:

   if (reference is a reference type
       && TraversalCategory is convertible to forward_traversal_tag)
     {
       if (TraversalCategory is convertible to random_access_traversal_tag)
         X1 = random_access_iterator_tag
       else if (TraversalCategory is convertible to bidirectional_traversal_tag)
         X1 = bidirectional_iterator_tag
       else
         X1 = forward_iterator_tag
     }
   else
   {
     if (TraversalCategory is convertible to single_pass_traversal_tag
         && reference != void)
       X1 = input_iterator_tag
     else
       X1 = output_iterator_tag
   }

2. X is convertible to TraversalCategory