Iterator Archetype

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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 a 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 TraversalCategory
>
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 Iter-
ator
```

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 ran-
dom_access_traversal_tag)
            X1 = random_access_iterator_tag
        else if (TraversalCategory is convertible to bidirec-
tional_traversal_tag)
            X1 = bidirectional_iterator_tag
        else
            X1 = forward_iterator_tag
    }
    else
    {
        if (TraversalCategory is convertible to sin-
gle_pass_traversal_tag
            && reference != void)
            X1 = input_iterator_tag
        else
            X1 = output_iterator_tag
    }
```

2. X is convertible to TraversalCategory