

final

Chapter 3 Unsafe Features

```

struct MonotonicAllocatorPartialImp : ManagedAllocator
{
    inline void deallocate(void* address) final { /* empty */ }
    // Deallocate the block at the specified address.
};

```

Notice that we have specified the empty **inline** deallocate member function of MonotonicAllocatorPartialImp to be **final**. A concrete monotonic allocator — e.g., a BufferedSequentialAllocator — can then derive from this partial implementation:

```

struct BufferedSequentialAllocator : MonotonicAllocatorPartialImp
{
    BufferedSequentialAllocator();
    // Create a default version of a buffered-sequential allocator.

    void* allocate(std::size_t numBytes);
    // Allocate a block of memory of at least the specified numBytes.

    void release();
    // Reclaim all memory currently allocated from this allocator.
};

```

Now consider two **allocator-aware** types, TypeA and TypeB, each of which is always constructed with some flavor of **managed** allocator:

```

struct TypeA
{
    TypeA(ManagedAllocator* a);
    // ...
};

struct TypeB
{
    TypeB(MonotonicAllocatorPartialImp* a);
    // ...
};

```

We now construct each of the types using the same concrete allocator object:

```

void client()
{
    BufferedSequentialAllocator a; // Concrete monotonic allocator object

    TypeA ta(&a); // deallocate is a virtual call to an empty function.
    TypeB tb(&a); // deallocate is an inline call to an empty function.
}

```

When TypeA invokes deallocate, it goes through the nonfinal, virtual function interface of ManagedAllocator and is subject to the runtime overhead of **dynamic dispatch**. Note