

Username: Pralay Patoria **Book:** The C++ Standard Library: A Tutorial and Reference, Second Edition. No part of any chapter or book may be reproduced or transmitted in any form by any means without the prior written permission for reprints and excerpts from the publisher of the book or chapter. Redistribution or other use that violates the fair use privilege under U.S. copyright laws (see 17 USC107) or that otherwise violates these Terms of Service is strictly prohibited. Violators will be prosecuted to the full extent of U.S. Federal and Massachusetts laws.

Chapter 12. Special Containers

The C++ standard library provides not only the containers for the STL framework but also some containers that fit some special needs and provide simple, almost self-explanatory, interfaces. You can group these containers into either the so-called *container adapters*, which adapt standard STL containers to fit special needs, or a *bitset*, which is a containers for bits or Boolean values.

There are three standard container adapters: stacks, queues, and priority queues. In priority queues, the elements are sorted automatically according to a sorting criterion. Thus, the "next" element of a priority queue is the element with the "highest" value.

A bitset is a bitfield with an arbitrary but fixed number of bits. Note that the C++ standard library also provides a special container with a variable size for Boolean values: `vector<bool>`. It is described in [Section 7.3.6, page 281](#).

Recent Changes with C++11

C++98 specified almost all features of the container adapters. Here is a list of the most important features added with C++11:

- Container adapters now provide type definitions for `reference` and `const_reference` ([see Section 12.4.1, page 645](#)).
- Container adapters now support move semantics and rvalue references:
 - `push()` provides move semantics now ([see Section 12.1.2, page 634](#), and [Section 12.4.4, page 647](#)).
 - Initial containers can be moved now ([see Section 12.4.2, page 646](#)).
- Container adapters provide the `emplace()` feature, which internally creates a new element initialized by the passed arguments ([see Section 12.1.2, page 634](#), and [Section 12.4.4, page 647](#)).
- Container adapters now provide `swap()` ([see Section 12.4.4, page 649](#)).
- Constructor adapters now allow you to pass a specific allocator to their constructors ([see Section 12.4.2, page 646](#)).