| | [**Overview**](http://docs.google.com/overview-summary.html) | **Package** | Class | [**Use**](http://docs.google.com/package-use.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**PREV PACKAGE**](http://docs.google.com/java/net/package-summary.html)   [**NEXT PACKAGE**](http://docs.google.com/java/nio/channels/package-summary.html) | [**FRAMES**](http://docs.google.com/index.html?java/nio/package-summary.html)    [**NO FRAMES**](http://docs.google.com/package-summary.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |

## Package java.nio

Defines buffers, which are containers for data, and provides an overview of the other NIO packages.

**See:**

[**Description**](#3znysh7)

| **Class Summary** | |
| --- | --- |
| [**Buffer**](http://docs.google.com/java/nio/Buffer.html) | A container for data of a specific primitive type. |
| [**ByteBuffer**](http://docs.google.com/java/nio/ByteBuffer.html) | A byte buffer. |
| [**ByteOrder**](http://docs.google.com/java/nio/ByteOrder.html) | A typesafe enumeration for byte orders. |
| [**CharBuffer**](http://docs.google.com/java/nio/CharBuffer.html) | A character buffer. |
| [**DoubleBuffer**](http://docs.google.com/java/nio/DoubleBuffer.html) | A double buffer. |
| [**FloatBuffer**](http://docs.google.com/java/nio/FloatBuffer.html) | A float buffer. |
| [**IntBuffer**](http://docs.google.com/java/nio/IntBuffer.html) | An int buffer. |
| [**LongBuffer**](http://docs.google.com/java/nio/LongBuffer.html) | A long buffer. |
| [**MappedByteBuffer**](http://docs.google.com/java/nio/MappedByteBuffer.html) | A direct byte buffer whose content is a memory-mapped region of a file. |
| [**ShortBuffer**](http://docs.google.com/java/nio/ShortBuffer.html) | A short buffer. |

| **Exception Summary** | |
| --- | --- |
| [**BufferOverflowException**](http://docs.google.com/java/nio/BufferOverflowException.html) | Unchecked exception thrown when a relative *put* operation reaches the target buffer's limit. |
| [**BufferUnderflowException**](http://docs.google.com/java/nio/BufferUnderflowException.html) | Unchecked exception thrown when a relative *get* operation reaches the source buffer's limit. |
| [**InvalidMarkException**](http://docs.google.com/java/nio/InvalidMarkException.html) | Unchecked exception thrown when an attempt is made to reset a buffer when its mark is not defined. |
| [**ReadOnlyBufferException**](http://docs.google.com/java/nio/ReadOnlyBufferException.html) | Unchecked exception thrown when a content-mutation method such as put or compact is invoked upon a read-only buffer. |

## Package java.nio Description

Defines buffers, which are containers for data, and provides an overview of the other NIO packages.

The central abstractions of the NIO APIs are:

* [*Buffers*](#2et92p0), which are containers for data;
* [*Charsets*](http://docs.google.com/charset/package-summary.html) and their associated *decoders* and *encoders*,  
  which translate between bytes and Unicode characters;
* [*Channels*](http://docs.google.com/channels/package-summary.html) of various types, which represent connections  
  to entities capable of performing I/O operations; and
* *Selectors* and *selection keys*, which together with  
  *selectable channels* define a [multiplexed, non-blocking](http://docs.google.com/channels/package-summary.html#multiplex)  
  [I/O](http://docs.google.com/channels/package-summary.html#multiplex) facility.

The java.nio package defines the buffer classes, which are used throughout the NIO APIs. The charset API is defined in the [java.nio.charset](http://docs.google.com/java/nio/charset/package-summary.html) package, and the channel and selector APIs are defined in the [java.nio.channels](http://docs.google.com/java/nio/channels/package-summary.html) package. Each of these subpackages has its own service-provider (SPI) subpackage, the contents of which can be used to extend the platform's default implementations or to construct alternative implementations.

| Buffers | Description |
| --- | --- |
| [Buffer](http://docs.google.com/java/nio/Buffer.html) | Position, limit, and capacity;  clear, flip, rewind, and mark/reset |
| [ByteBuffer](http://docs.google.com/java/nio/ByteBuffer.html) | Get/put, compact, views; allocate, wrap |
| [MappedByteBuffer](http://docs.google.com/java/nio/MappedByteBuffer.html) | A byte buffer mapped to a file |
| [CharBuffer](http://docs.google.com/java/nio/CharBuffer.html) | Get/put, compact; allocate, wrap |
| [DoubleBuffer](http://docs.google.com/java/nio/DoubleBuffer.html) | ' ' |
| [FloatBuffer](http://docs.google.com/java/nio/FloatBuffer.html) | ' ' |
| [IntBuffer](http://docs.google.com/java/nio/IntBuffer.html) | ' ' |
| [LongBuffer](http://docs.google.com/java/nio/LongBuffer.html) | ' ' |
| [ShortBuffer](http://docs.google.com/java/nio/ShortBuffer.html) | ' ' |
| [ByteOrder](http://docs.google.com/java/nio/ByteOrder.html) | Typesafe enumeration for byte orders |

A *buffer* is a container for a fixed amount of data of a specific primitive type. In addition to its content a buffer has a *position*, which is the index of the next element to be read or written, and a *limit*, which is the index of the first element that should not be read or written. The base [Buffer](http://docs.google.com/java/nio/Buffer.html) class defines these properties as well as methods for *clearing*, *flipping*, and *rewinding*, for *marking* the current position, and for *resetting* the position to the previous mark.

There is a buffer class for each non-boolean primitive type. Each class defines a family of *get* and *put* methods for moving data out of and in to a buffer, methods for *compacting*, *duplicating*, and *slicing* a buffer, and static methods for *allocating* a new buffer as well as for *wrapping* an existing array into a buffer.

Byte buffers are distinguished in that they can be used as the sources and targets of I/O operations. They also support several features not found in the other buffer classes:

* A byte buffer can be allocated as a  [*direct*](http://docs.google.com/ByteBuffer.html#direct) buffer, in which case the Java virtual machine will make a best effort to perform native I/O operations directly upon it.
* A byte buffer can be created by [*mapping*](http://docs.google.com/java/nio/channels/FileChannel.html#map(java.nio.channels.FileChannel.MapMode,%20long,%20long)) a region of a file directly into memory, in which case a few additional file-related operations defined in the [MappedByteBuffer](http://docs.google.com/java/nio/MappedByteBuffer.html) class are available.
* A byte buffer provides access to its content as either a heterogeneous or homogeneous sequence of [binary data](http://docs.google.com/ByteBuffer.html#bin) of any non-boolean primitive type, in either big-endian or little-endian [byte order](http://docs.google.com/ByteOrder.html).

Unless otherwise noted, passing a null argument to a constructor or method in any class or interface in this package will cause a [NullPointerException](http://docs.google.com/java/lang/NullPointerException.html) to be thrown.

**Since:** 1.4

| | [**Overview**](http://docs.google.com/overview-summary.html) | **Package** | Class | [**Use**](http://docs.google.com/package-use.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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[Submit a bug or feature](http://bugs.sun.com/services/bugreport/index.jsp)

For further API reference and developer documentation, see [Java SE Developer Documentation](http://docs.google.com/webnotes/devdocs-vs-specs.html). That documentation contains more detailed, developer-targeted descriptions, with conceptual overviews, definitions of terms, workarounds, and working code examples.

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