

# Java I/O, NIO, and NIO.2

Java I/O support is included in the [java.io](#) and [java.nio](#) packages. Together these packages include the following features:

对象序列化

- Input and output through data streams, serialization and the file system.
- Charsets, decoders, and encoders, for translating between bytes and Unicode characters.
- Access to file, file attributes and file systems.
- APIs for building scalable servers using asynchronous or multiplexed, non-blocking I/O.

字节和字符之间转换

NIO APIs: 使用异步或多路复用的非阻塞I/O来构建可伸缩的服务器

## Tutorials and Programmer's Guides

- The Basic I/O section of [The Java Tutorial](#) and, in particular, [File I/O \(featuring NIO.2\)](#)
- [Developing a Custom File System Provider](#)
- [Zip File System Provider](#)
- [Troubleshooting Tips](#)

## API Specification

- [java.io \(description\)](#) - Supports system input and output, and object serialization to the file system
- [java.nio \(description\)](#) - Defines buffers for bulk memory operations. Buffers may be allocated in direct memory for high performance.
- [java.nio.channels \(description\)](#) - Defines channels, an abstraction for devices capable of performing I/O operations; defines selectors for multiplexed, non-blocking I/O
- [java.nio.channels.spi \(description\)](#) - Provides implementations for channels
- [java.nio.file](#) - Defines interfaces and classes to access files and file systems.
- [java.nio.file.attribute](#) - Defines interfaces and classes for accessing file system attributes.
- [java.nio.file.spi](#) - Defines classes for creating a file system implementation.
- [java.nio.charset \(description\)](#) - Defines charsets, decoders, and encoders, for translating between bytes and Unicode characters
- [java.nio.charset.spi \(description\)](#) - Provides implementations for charsets
- [com.sun.nio.sctp \(description\)](#) - A Java API for Stream Control Transport Protocol

缓冲区: 用于大容量内存操作, 为高性能在物理内存/堆外内存中分配

通道: 能执行I/O操作的设备的抽象; 选择器: 多路复用的非阻塞I/O

## Examples

- [NIO and NIO.2 Examples](#)

## Enhancements

- [Enhancements in JDK 8 Release](#)
- [Enhancements in JDK 7 Release](#)
- [Enhancements in JDK 6 Release](#)
- [Enhancements in JDK 5.0 Release](#)
- [Enhancements in J2SDK 1.4](#)
- [Previous Enhancements](#)

## More Information

- [Supported Encodings](#)
- [Object Serialization](#)