

# Streaming Interfaces

Ice provides convenient interfaces for streaming Slice types to and from a sequence of bytes. You can use these interfaces in many situations, such as when serializing types for persistent storage, and when using Ice's [dynamic invocation and dispatch facility](#).

The streaming interfaces are not defined in Slice, but are rather a collection of native classes provided by each language mapping.

 The streaming interfaces are currently supported in C++, Java, and .NET.

A default implementation of the interfaces uses the [Ice encoding](#), but other implementations are possible.

There are two primary abstract classes: `InputStream` and `OutputStream`. As you might guess, `InputStream` is used to extract Slice types from a sequence of bytes, while `OutputStream` is used to convert Slice types into a sequence of bytes. The classes provide the functions necessary to manipulate all of the core Slice types:

- Primitives (`bool`, `int`, `string`, etc.)
- Sequences of primitives
- Proxies
- Objects

The classes also provide functions that handle various details of the Ice encoding. Using these functions, you can manually insert and extract constructed types, such as dictionaries and structures, but doing so is tedious and error-prone. To make insertion and extraction of constructed types easier, the Slice compilers can optionally generate helper functions that manage the low-level details for you.

The remainder of this section describes the streaming interfaces for each supported language mapping. To properly use the streaming interfaces, you should be familiar with the [Ice encoding](#). An example that demonstrates the use of the streaming interfaces is located in `demo/Ice/invoke` in your Ice distribution.

## Topics

- [C++ Streaming Interfaces](#)
- [Java Streaming Interfaces](#)
- [C-Sharp Streaming Interfaces](#)

## See Also

- [Dynamic Invocation and Dispatch](#)
- [Data Encoding](#)