

NAME

bio - Basic I/O abstraction

SYNOPSIS

```
#include <openssl/bio.h>
```

DESCRIPTION

A BIO is an I/O abstraction, it hides many of the underlying I/O details from an application. If an application uses a BIO for its I/O it can transparently handle SSL connections, unencrypted network connections and file I/O.

There are two types of BIO, a source/sink BIO and a filter BIO.

As its name implies a source/sink BIO is a source and/or sink of data, examples include a socket BIO and a file BIO.

A filter BIO takes data from one BIO and passes it through to another, or the application. The data may be left unmodified (for example a message digest BIO) or translated (for example an encryption BIO). The effect of a filter BIO may change according to the I/O operation it is performing: for example an encryption BIO will encrypt data if it is being written to and decrypt data if it is being read from.

BIOs can be joined together to form a chain (a single BIO is a chain with one component). A chain normally consists of one source/sink BIO and one or more filter BIOs. Data read from or written to the first BIO then traverses the chain to the end (normally a source/sink BIO).

Some BIOs (such as memory BIOs) can be used immediately after calling **BIO_new()**. Others (such as file BIOs) need some additional initialization, and frequently a utility function exists to create and initialize such BIOs.

If **BIO_free()** is called on a BIO chain it will only free one BIO resulting in a memory leak.

Calling **BIO_free_all()** on a single BIO has the same effect as calling **BIO_free()** on it other than the discarded return value.

Normally the *type* argument is supplied by a function which returns a pointer to a **BIO_METHOD**. There is a naming convention for such functions: a source/sink BIO typically starts with *BIO_s_* and a filter BIO with *BIO_f_*.

EXAMPLES

Create a memory BIO:

```
BIO *mem = BIO_new(BIO_s_mem());
```

SEE ALSO

BIO_ctrl(3), **BIO_f_base64(3)**, **BIO_f_buffer(3)**, **BIO_f_cipher(3)**, **BIO_f_md(3)**, **BIO_f_null(3)**, **BIO_f_ssl(3)**, **BIO_f_readbuffer(3)**, **BIO_find_type(3)**, **BIO_new(3)**, **BIO_new_bio_pair(3)**, **BIO_push(3)**, **BIO_read_ex(3)**, **BIO_s_accept(3)**, **BIO_s_bio(3)**, **BIO_s_connect(3)**, **BIO_s_fd(3)**, **BIO_s_file(3)**, **BIO_s_mem(3)**, **BIO_s_null(3)**, **BIO_s_socket(3)**, **BIO_set_callback(3)**, **BIO_should_retry(3)**

COPYRIGHT

Copyright 2000-2021 The OpenSSL Project Authors. All Rights Reserved.

Licensed under the Apache License 2.0 (the "License"). You may not use this file except in compliance with the License. You can obtain a copy in the file LICENSE in the source distribution or at <https://www.openssl.org/source/license.html>.