

**NAME**

BIO\_get\_new\_index, BIO\_meth\_new, BIO\_meth\_free, BIO\_meth\_get\_read\_ex, BIO\_meth\_set\_read\_ex, BIO\_meth\_get\_write\_ex, BIO\_meth\_set\_write\_ex, BIO\_meth\_get\_write, BIO\_meth\_set\_write, BIO\_meth\_get\_read, BIO\_meth\_set\_read, BIO\_meth\_get\_puts, BIO\_meth\_set\_puts, BIO\_meth\_get\_gets, BIO\_meth\_set\_gets, BIO\_meth\_get\_ctrl, BIO\_meth\_set\_ctrl, BIO\_meth\_get\_create, BIO\_meth\_set\_create, BIO\_meth\_get\_destroy, BIO\_meth\_set\_destroy, BIO\_meth\_get\_callback\_ctrl, BIO\_meth\_set\_callback\_ctrl - Routines to build up BIO methods

**SYNOPSIS**

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

```
int BIO_get_new_index(void);
```

```
BIO_METHOD *BIO_meth_new(int type, const char *name);
```

```
void BIO_meth_free(BIO_METHOD *biom);
```

```
int (*BIO_meth_get_write_ex(const BIO_METHOD *biom))(BIO *, const char *, size_t,
                                                    size_t *);
```

```
int (*BIO_meth_get_write(const BIO_METHOD *biom))(BIO *, const char *, int);
```

```
int BIO_meth_set_write_ex(BIO_METHOD *biom,
                          int (*bwrite)(BIO *, const char *, size_t, size_t *));
```

```
int BIO_meth_set_write(BIO_METHOD *biom,
                       int (*write)(BIO *, const char *, int));
```

```
int (*BIO_meth_get_read_ex(const BIO_METHOD *biom))(BIO *, char *, size_t, size_t *);
```

```
int (*BIO_meth_get_read(const BIO_METHOD *biom))(BIO *, char *, int);
```

```
int BIO_meth_set_read_ex(BIO_METHOD *biom,
                         int (*bread)(BIO *, char *, size_t, size_t *));
```

```
int BIO_meth_set_read(BIO_METHOD *biom, int (*read)(BIO *, char *, int));
```

```
int (*BIO_meth_get_puts(const BIO_METHOD *biom))(BIO *, const char *);
```

```
int BIO_meth_set_puts(BIO_METHOD *biom, int (*puts)(BIO *, const char *));
```

```
int (*BIO_meth_get_gets(const BIO_METHOD *biom))(BIO *, char *, int);
```

```
int BIO_meth_set_gets(BIO_METHOD *biom,
                     int (*gets)(BIO *, char *, int));
```

```
long (*BIO_meth_get_ctrl(const BIO_METHOD *biom))(BIO *, int, long, void *);
```

```

int BIO_meth_set_ctrl(BIO_METHOD *biom,
    long (*ctrl)(BIO *, int, long, void *));

int (*BIO_meth_get_create(const BIO_METHOD *bion))(BIO *);
int BIO_meth_set_create(BIO_METHOD *biom, int (*create)(BIO *));

int (*BIO_meth_get_destroy(const BIO_METHOD *biom))(BIO *);
int BIO_meth_set_destroy(BIO_METHOD *biom, int (*destroy)(BIO *));

long (*BIO_meth_get_callback_ctrl(const BIO_METHOD *biom))(BIO *, int, BIO_info_cb *);
int BIO_meth_set_callback_ctrl(BIO_METHOD *biom,
    long (*callback_ctrl)(BIO *, int, BIO_info_cb *));

```

## DESCRIPTION

The **BIO\_METHOD** type is a structure used for the implementation of new BIO types. It provides a set of functions used by OpenSSL for the implementation of the various BIO capabilities. See the **bio(7)** page for more information.

**BIO\_meth\_new()** creates a new **BIO\_METHOD** structure. It should be given a unique integer **type** and a string that represents its **name**. Use **BIO\_get\_new\_index()** to get the value for **type**.

The set of standard OpenSSL provided BIO types is provided in `<openssl/bio.h>`. Some examples include **BIO\_TYPE\_BUFFER** and **BIO\_TYPE\_CIPHER**. Filter BIOs should have a type which have the "filter" bit set (**BIO\_TYPE\_FILTER**). Source/sink BIOs should have the "source/sink" bit set (**BIO\_TYPE\_SOURCE\_SINK**). File descriptor based BIOs (e.g. socket, fd, connect, accept etc) should additionally have the "descriptor" bit set (**BIO\_TYPE\_DESCRIPTOR**). See the **BIO\_find\_type(3)** page for more information.

**BIO\_meth\_free()** destroys a **BIO\_METHOD** structure and frees up any memory associated with it.

**BIO\_meth\_get\_write\_ex()** and **BIO\_meth\_set\_write\_ex()** get and set the function used for writing arbitrary length data to the BIO respectively. This function will be called in response to the application calling **BIO\_write\_ex()** or **BIO\_write()**. The parameters for the function have the same meaning as for **BIO\_write\_ex()**. Older code may call **BIO\_meth\_get\_write()** and **BIO\_meth\_set\_write()** instead. Applications should not call both **BIO\_meth\_set\_write\_ex()** and **BIO\_meth\_set\_write()** or call **BIO\_meth\_get\_write()** when the function was set with **BIO\_meth\_set\_write\_ex()**.

**BIO\_meth\_get\_read\_ex()** and **BIO\_meth\_set\_read\_ex()** get and set the function used for reading arbitrary length data from the BIO respectively. This function will be called in response to the application calling **BIO\_read\_ex()** or **BIO\_read()**. The parameters for the function have the same

meaning as for **BIO\_read\_ex()**. Older code may call **BIO\_meth\_get\_read()** and **BIO\_meth\_set\_read()** instead. Applications should not call both **BIO\_meth\_set\_read\_ex()** and **BIO\_meth\_set\_read()** or call **BIO\_meth\_get\_read()** when the function was set with **BIO\_meth\_set\_read\_ex()**.

**BIO\_meth\_get\_puts()** and **BIO\_meth\_set\_puts()** get and set the function used for writing a NULL terminated string to the BIO respectively. This function will be called in response to the application calling **BIO\_puts()**. The parameters for the function have the same meaning as for **BIO\_puts()**.

**BIO\_meth\_get\_gets()** and **BIO\_meth\_set\_gets()** get and set the function typically used for reading a line of data from the BIO respectively (see the **BIO\_gets(3)** page for more information). This function will be called in response to the application calling **BIO\_gets()**. The parameters for the function have the same meaning as for **BIO\_gets()**.

**BIO\_meth\_get\_ctrl()** and **BIO\_meth\_set\_ctrl()** get and set the function used for processing ctrl messages in the BIO respectively. See the **BIO\_ctrl(3)** page for more information. This function will be called in response to the application calling **BIO\_ctrl()**. The parameters for the function have the same meaning as for **BIO\_ctrl()**.

**BIO\_meth\_get\_create()** and **BIO\_meth\_set\_create()** get and set the function used for creating a new instance of the BIO respectively. This function will be called in response to the application calling **BIO\_new()** and passing in a pointer to the current BIO\_METHOD. The **BIO\_new()** function will allocate the memory for the new BIO, and a pointer to this newly allocated structure will be passed as a parameter to the function. If a create function is set, **BIO\_new()** will not mark the BIO as initialised on allocation. **BIO\_set\_init(3)** must then be called either by the create function, or later, by a BIO ctrl function, once BIO initialisation is complete.

**BIO\_meth\_get\_destroy()** and **BIO\_meth\_set\_destroy()** get and set the function used for destroying an instance of a BIO respectively. This function will be called in response to the application calling **BIO\_free()**. A pointer to the BIO to be destroyed is passed as a parameter. The destroy function should be used for BIO specific clean up. The memory for the BIO itself should not be freed by this function.

**BIO\_meth\_get\_callback\_ctrl()** and **BIO\_meth\_set\_callback\_ctrl()** get and set the function used for processing callback ctrl messages in the BIO respectively. See the **BIO\_callback\_ctrl(3)** page for more information. This function will be called in response to the application calling **BIO\_callback\_ctrl()**. The parameters for the function have the same meaning as for **BIO\_callback\_ctrl()**.

## RETURN VALUES

**BIO\_get\_new\_index()** returns the new BIO type value or -1 if an error occurred.

**BIO\_meth\_new(int type, const char \*name)** returns a valid **BIO\_METHOD** or NULL if an error

occurred.

The **BIO\_meth\_set** functions return 1 on success or 0 on error.

The **BIO\_meth\_get** functions return the corresponding function pointers.

## SEE ALSO

**bio(7)**, **BIO\_find\_type(3)**, **BIO\_ctrl(3)**, **BIO\_read\_ex(3)**, **BIO\_new(3)**

## HISTORY

The functions described here were added in OpenSSL 1.1.0.

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