

NAME

DECLARE_PEM_rw, PEM_read_CMS, PEM_read_bio_CMS, PEM_write_CMS, PEM_write_bio_CMS,
 PEM_write_DHxparams, PEM_write_bio_DHxparams, PEM_read_ECCKParameters,
 PEM_read_bio_ECCKParameters, PEM_write_ECCKParameters, PEM_write_bio_ECCKParameters,
 PEM_read_ECPrivateKey, PEM_write_ECPrivateKey, PEM_write_bio_ECPrivateKey,
 PEM_read_EC_PUBKEY, PEM_read_bio_EC_PUBKEY, PEM_write_EC_PUBKEY,
 PEM_write_bio_EC_PUBKEY, PEM_read_NETSCAPE_CERT_SEQUENCE,
 PEM_read_bio_NETSCAPE_CERT_SEQUENCE, PEM_write_NETSCAPE_CERT_SEQUENCE,
 PEM_write_bio_NETSCAPE_CERT_SEQUENCE, PEM_read_PKCS8, PEM_read_bio_PKCS8,
 PEM_write_PKCS8, PEM_write_bio_PKCS8, PEM_write_PKCS8_PRIV_KEY_INFO,
 PEM_read_bio_PKCS8_PRIV_KEY_INFO, PEM_read_PKCS8_PRIV_KEY_INFO,
 PEM_write_bio_PKCS8_PRIV_KEY_INFO, PEM_read_SSL_SESSION, PEM_read_bio_SSL_SESSION,
 PEM_write_SSL_SESSION, PEM_write_bio_SSL_SESSION - PEM object encoding routines

SYNOPSIS

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

```
DECLARE_PEM_rw(name, TYPE)
```

```
TYPE *PEM_read_TYPE(FILE *fp, TYPE **a, pem_password_cb *cb, void *u);
TYPE *PEM_read_bio_TYPE(BIO *bp, TYPE **a, pem_password_cb *cb, void *u);
int PEM_write_TYPE(FILE *fp, const TYPE *a);
int PEM_write_bio_TYPE(BIO *bp, const TYPE *a);
```

DESCRIPTION

In the description below, *TYPE* is used as a placeholder for any of the OpenSSL datatypes, such as *X509*. The macro **DECLARE_PEM_rw** expands to the set of declarations shown in the next four lines of the synopsis.

These routines convert between local instances of ASN1 datatypes and the PEM encoding. For more information on the templates, see [ASN1_ITEM\(3\)](#). For more information on the lower-level routines used by the functions here, see [PEM_read\(3\)](#).

PEM_read_TYPE() reads a PEM-encoded object of *TYPE* from the file **fp** and returns it. The **cb** and **u** parameters are as described in [pem_password_cb\(3\)](#).

PEM_read_bio_TYPE() is similar to *PEM_read_TYPE()* but reads from the BIO **bp**.

PEM_write_TYPE() writes the PEM encoding of the object **a** to the file **fp**.

PEM_write_bio_TYPE() similarly writes to the BIO **bp**.

RETURN VALUES

PEM_read_TYPE() and *PEM_read_bio_TYPE()* return a pointer to an allocated object, which should be released by calling *TYPE_free()*, or NULL on error.

PEM_write_TYPE() and *PEM_write_bio_TYPE()* return the number of bytes written or zero on error.

SEE ALSO

[PEM_read\(3\)](#)

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