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## **Red Hat Enterprise Linux Release 9.2 Manual Pages on 'd2i\_PrivateKey\_bio.3ossl' command**

**\$ man d2i\_PrivateKey\_bio.3ossl**

D2I\_PRIVATEKEY(3ossl)          OpenSSL          D2I\_PRIVATEKEY(3ossl)

### NAME

d2i\_PrivateKey\_ex, d2i\_PrivateKey, d2i\_PublicKey, d2i\_KeyParams,  
d2i\_AutoPrivateKey\_ex, d2i\_AutoPrivateKey, i2d\_PrivateKey,  
i2d\_PublicKey, i2d\_KeyParams, i2d\_KeyParams\_bio, d2i\_PrivateKey\_ex\_bio,  
d2i\_PrivateKey\_bio, d2i\_PrivateKey\_ex\_fp, d2i\_PrivateKey\_fp,  
d2i\_KeyParams\_bio, i2d\_PrivateKey\_bio, i2d\_PrivateKey\_fp - decode and  
encode functions for reading and saving EVP\_PKEY structures

### SYNOPSIS

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

```
EVP_PKEY *d2i_PrivateKey_ex(int type, EVP_PKEY **a, const unsigned char **pp,  
    long length, OSSL_LIB_CTX *libctx,  
    const char *propq);
```

```
EVP_PKEY *d2i_PrivateKey(int type, EVP_PKEY **a, const unsigned char **pp,  
    long length);
```

```
EVP_PKEY *d2i_PublicKey(int type, EVP_PKEY **a, const unsigned char **pp,  
    long length);
```

```
EVP_PKEY *d2i_KeyParams(int type, EVP_PKEY **a, const unsigned char **pp,  
    long length);
```

```
EVP_PKEY *d2i_AutoPrivateKey_ex(EVP_PKEY **a, const unsigned char **pp,
```

```

        long length, OSSL_LIB_CTX *libctx,
        const char *propq);
EVP_PKEY *d2i_AutoPrivateKey(EVP_PKEY **a, const unsigned char **pp,
        long length);

int i2d_PrivateKey(const EVP_PKEY *a, unsigned char **pp);
int i2d_PublicKey(const EVP_PKEY *a, unsigned char **pp);
int i2d_KeyParams(const EVP_PKEY *a, unsigned char **pp);
int i2d_KeyParams_bio(BIO *bp, const EVP_PKEY *pkey);
EVP_PKEY *d2i_KeyParams_bio(int type, EVP_PKEY **a, BIO *in);

#include <openssl/x509.h>

EVP_PKEY *d2i_PrivateKey_ex_bio(BIO *bp, EVP_PKEY **a, OSSL_LIB_CTX *libctx,
        const char *propq);
EVP_PKEY *d2i_PrivateKey_bio(BIO *bp, EVP_PKEY **a);
EVP_PKEY *d2i_PrivateKey_ex_fp(FILE *fp, EVP_PKEY **a, OSSL_LIB_CTX *libctx,
        const char *propq);
EVP_PKEY *d2i_PrivateKey_fp(FILE *fp, EVP_PKEY **a);

int i2d_PrivateKey_bio(BIO *bp, const EVP_PKEY *pkey);
int i2d_PrivateKey_fp(FILE *fp, const EVP_PKEY *pkey);

```

## DESCRIPTION

d2i\_PrivateKey\_ex() decodes a private key using algorithm type. It attempts to use any key-specific format or PKCS#8 unencrypted PrivateKeyInfo format. The type parameter should be a public key algorithm constant such as EVP\_PKEY\_RSA. An error occurs if the decoded key does not match type. Some private key decoding implementations may use cryptographic algorithms (for example to automatically derive the public key if it is not explicitly included in the encoding). In this case the supplied library context libctx and property query string propq are used. If successful and the a parameter is not NULL the

function assigns the returned EVP\_PKEY structure pointer to \*a, overwriting any previous value.

d2i\_PrivateKey() does the same as d2i\_PrivateKey\_ex() except that the default library context and property query string are used.

d2i\_PublicKey() does the same for public keys. d2i\_KeyParams() does the same for key parameters.

The d2i\_PrivateKey\_ex\_bio() and d2i\_PrivateKey\_bio() functions are similar to d2i\_PrivateKey\_ex() and d2i\_PrivateKey() respectively except that they decode the data read from the given BIO. The

d2i\_PrivateKey\_ex\_fp() and d2i\_PrivateKey\_fp() functions are the same except that they read the data from the given FILE.

d2i\_AutoPrivateKey\_ex() and d2i\_AutoPrivateKey() are similar to d2i\_PrivateKey\_ex() and d2i\_PrivateKey() respectively except that they attempt to automatically detect the private key format.

i2d\_PrivateKey() encodes a. It uses a key specific format or, if none is defined for that key type, PKCS#8 unencrypted PrivateKeyInfo format.

i2d\_PublicKey() does the same for public keys. i2d\_KeyParams() does the same for key parameters. These functions are similar to the d2i\_X509() functions; see d2i\_X509(3). i2d\_PrivateKey\_bio() and i2d\_PrivateKey\_fp() do the same thing except that they encode to a BIO or FILE respectively. Again, these work similarly to the functions described in d2i\_X509(3).

## NOTES

All the functions that operate on data in memory update the data pointer \*pp after a successful operation, just like the other d2i and i2d functions; see d2i\_X509(3).

All these functions use DER format and unencrypted keys. Applications

wishing to encrypt or decrypt private keys should use other functions such as `d2i_PKCS8PrivateKey()` instead.

To decode a key with type `EVP_PKEY_EC`, `d2i_PublicKey()` requires `*a` to be a non-NULL `EVP_PKEY` structure assigned an `EC_KEY` structure referencing the proper `EC_GROUP`.

## RETURN VALUES

The `d2i_PrivateKey_ex()`, `d2i_PrivateKey()`, `d2i_AutoPrivateKey_ex()`, `d2i_AutoPrivateKey()`, `d2i_PrivateKey_ex_bio()`, `d2i_PrivateKey_bio()`, `d2i_PrivateKey_ex_fp()`, `d2i_PrivateKey_fp()`, `d2i_PublicKey()`, `d2i_KeyParams()` and `d2i_KeyParams_bio()` functions return a valid `EVP_PKEY` structure or `NULL` if an error occurs. The error code can be obtained by calling `ERR_get_error(3)`.

`i2d_PrivateKey()`, `i2d_PrivateKey_bio()`, `i2d_PrivateKey_fp()`, `i2d_PublicKey()`, `i2d_KeyParams()` `i2d_KeyParams_bio()` return the number of bytes successfully encoded or a negative value if an error occurs. The error code can be obtained by calling `ERR_get_error(3)`.

## SEE ALSO

`crypto(7)`, `d2i_PKCS8PrivateKey_bio(3)`

## HISTORY

`d2i_PrivateKey_ex()`, `d2i_PrivateKey_ex_bio()`, `d2i_PrivateKey_ex_fp()`, and `d2i_AutoPrivateKey_ex()` were added in OpenSSL 3.0.

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