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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'PKCS5_v2_PBE_keyivgen_ex.3ossl' command

```
$ man PKCS5_v2_PBE_keyivgen_ex.3ossl
```

```
PKCS5_PBE_KEYIVGEN(3ossl)      OpenSSL      PKCS5_PBE_KEYIVGEN(3ossl)
```

NAME

PKCS5_PBE_keyivgen, PKCS5_PBE_keyivgen_ex, PKCS5_pbe2_set, PKCS5_pbe2_set_iv, PKCS5_pbe2_set_iv_ex, PKCS5_pbe_set, PKCS5_pbe_set_ex, PKCS5_pbe2_set_scrypt, PKCS5_pbe_set0_algor, PKCS5_pbe_set0_algor_ex, PKCS5_v2_PBE_keyivgen, PKCS5_v2_PBE_keyivgen_ex, PKCS5_v2_scrypt_keyivgen, PKCS5_v2_scrypt_keyivgen_ex, PKCS5_pbkdf2_set, PKCS5_pbkdf2_set_ex, EVP_PBE_scrypt, EVP_PBE_scrypt_ex - PKCS#5 Password based encryption routines

SYNOPSIS

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

```
int PKCS5_PBE_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen, ASN1_TYPE *param, const EVP_CIPHER *cipher, const EVP_MD *md, int en_de);
```

```
int PKCS5_PBE_keyivgen_ex(EVP_CIPHER_CTX *cctx, const char *pass, int passlen, ASN1_TYPE *param, const EVP_CIPHER *cipher, const EVP_MD *md, int en_de, OSSL_LIB_CTX *libctx, const char *propq);
```

```
int PKCS5_v2_PBE_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
```

```

ASN1_TYPE *param, const EVP_CIPHER *cipher,
const EVP_MD *md, int en_de);

int PKCS5_v2_PBE_keyivgen_ex(EVP_CIPHER_CTX *ctx, const char *pass, int passlen,
ASN1_TYPE *param, const EVP_CIPHER *cipher,
const EVP_MD *md, int en_de,
OSSL_LIB_CTX *libctx, const char *propq);

int EVP_PBE_scrypt(const char *pass, size_t passlen,
const unsigned char *salt, size_t saltlen,
uint64_t N, uint64_t r, uint64_t p, uint64_t maxmem,
unsigned char *key, size_t keylen);

int EVP_PBE_scrypt_ex(const char *pass, size_t passlen,
const unsigned char *salt, size_t saltlen,
uint64_t N, uint64_t r, uint64_t p, uint64_t maxmem,
unsigned char *key, size_t keylen,
OSSL_LIB_CTX *ctx, const char *propq);

int PKCS5_v2_scrypt_keyivgen(EVP_CIPHER_CTX *ctx, const char *pass,
int passlen, ASN1_TYPE *param,
const EVP_CIPHER *c, const EVP_MD *md, int en_de);

int PKCS5_v2_scrypt_keyivgen_ex(EVP_CIPHER_CTX *ctx, const char *pass,
int passlen, ASN1_TYPE *param,
const EVP_CIPHER *c, const EVP_MD *md, int en_de,
OSSL_LIB_CTX *libctx, const char *propq);

#include <openssl/x509.h>

int PKCS5_pbe_set0_algor(X509_ALGOR *algor, int alg, int iter,
const unsigned char *salt, int saltlen);

int PKCS5_pbe_set0_algor_ex(X509_ALGOR *algor, int alg, int iter,
const unsigned char *salt, int saltlen,
OSSL_LIB_CTX *libctx);

X509_ALGOR *PKCS5_pbe_set(int alg, int iter,
const unsigned char *salt, int saltlen);

```

```

X509_ALGOR *PKCS5_pbe_set_ex(int alg, int iter,
                               const unsigned char *salt, int saltlen,
                               OSSL_LIB_CTX *libctx);

X509_ALGOR *PKCS5_pbe2_set(const EVP_CIPHER *cipher, int iter,
                            unsigned char *salt, int saltlen);

X509_ALGOR *PKCS5_pbe2_set_iv(const EVP_CIPHER *cipher, int iter,
                               unsigned char *salt, int saltlen,
                               unsigned char *aiv, int prf_nid);

X509_ALGOR *PKCS5_pbe2_set_iv_ex(const EVP_CIPHER *cipher, int iter,
                                   unsigned char *salt, int saltlen,
                                   unsigned char *aiv, int prf_nid,
                                   OSSL_LIB_CTX *libctx);

X509_ALGOR *PKCS5_pbe2_set_scrypt(const EVP_CIPHER *cipher,
                                   const unsigned char *salt, int saltlen,
                                   unsigned char *aiv, uint64_t N, uint64_t r,
                                   uint64_t p);

X509_ALGOR *PKCS5_pbkdf2_set(int iter, unsigned char *salt, int saltlen,
                              int prf_nid, int keylen);

X509_ALGOR *PKCS5_pbkdf2_set_ex(int iter, unsigned char *salt, int saltlen,
                                  int prf_nid, int keylen,
                                  OSSL_LIB_CTX *libctx);

```

DESCRIPTION

Key Derivation

PKCS5_PBE_keyivgen() and PKCS5_PBE_keyivgen_ex() take a password pass of length passlen, parameters param and a message digest function md_type and performs a key derivation according to PKCS#5 PBES1. The resulting key is then used to initialise the cipher context ctx with a cipher cipher for encryption (en_de=1) or decryption (en_de=0).

pass is an optional parameter and can be NULL. If passlen is -1, then

the function will calculate the length of pass using `strlen()`.

`PKCS5_v2_PBE_keyivgen()` and `PKCS5_v2_PBE_keyivgen_ex()` are similar to the above but instead use PKCS#5 PBES2 as the encryption algorithm using the supplied parameters.

`PKCS5_v2_scrypt_keyivgen()` and `PKCS5_v2_scrypt_keyivgen_ex()` use SCRYPT as the key derivation part of the encryption algorithm.

`salt` is the salt used in the derivation of length `saltlen`. If the salt is NULL, then `saltlen` must be 0. The function will not attempt to calculate the length of the salt because it is not assumed to be NULL terminated.

`iter` is the iteration count and its value should be greater than or equal to 1. RFC 2898 suggests an iteration count of at least 1000. Any `iter` less than 1 is treated as a single iteration.

`digest` is the message digest function used in the derivation.

Functions ending in `_ex()` take optional parameters `libctx` and `propq` which are used to select appropriate algorithm implementations.

Algorithm Identifier Creation

`PKCS5_pbe_set()`, `PKCS5_pbe_set_ex()`, `PKCS5_pbe2_set()`, `PKCS5_pbe2_set_iv()`, `PKCS5_pbe2_set_iv_ex()` and `PKCS5_pbe2_set_scrypt()` generate an `X509_ALGOR` object which represents an `AlgorithmIdentifier` containing the algorithm OID and associated parameters for the PBE algorithm.

`PKCS5_pbkdf2_set()` and `PKCS5_pbkdf2_set_ex()` generate an `X509_ALGOR` object which represents an `AlgorithmIdentifier` containing the algorithm OID and associated parameters for the PBKDF2 algorithm.

PKCS5_pbe_set0_algor() and PKCS5_pbe_set0_algor_ex() set the PBE algorithm OID and parameters into the supplied X509_ALGOR.

NOTES

The *_keyivgen() functions are typically used in PKCS#12 to encrypt objects.

These functions make no assumption regarding the given password. It will simply be treated as a byte sequence.

RETURN VALUES

PKCS5_PBE_keyivgen(), PKCS5_v2_PBE_keyivgen(), PKCS5_v2_PBE_keyivgen_ex(), PKCS5_v2_scrypt_keyivgen(), PKCS5_v2_scrypt_keyivgen_ex(), PKCS5_pbe_set0_algor() and PKCS5_pbe_set0_algor_ex() return 1 for success and 0 if an error occurs.

PKCS5_pbe_set(), PKCS5_pbe_set_ex(), PKCS5_pbe2_set(), PKCS5_pbe2_set_iv(), PKCS5_pbe2_set_iv_ex(), PKCS5_pbe2_set_scrypt(), PKCS5_pbkdf2_set() and PKCS5_pbkdf2_set_ex() return an X509_ALGOR object or NULL if an error occurs.

CONFORMING TO

IETF RFC 8018 (<<https://tools.ietf.org/html/rfc8018>>)

SEE ALSO

EVP_PBE_CipherInit_ex(3), PKCS12_pbe_crypt_ex(3),
passphrase-encoding(7)

HISTORY

PKCS5_v2_PBE_keyivgen_ex(), EVP_PBE_scrypt_ex(),
PKCS5_v2_scrypt_keyivgen_ex(), PKCS5_pbe_set0_algor_ex(),

PKCS5_pbe_set_ex(), PKCS5_pbe2_set_iv_ex() and PKCS5_pbkdf2_set_ex() were added in OpenSSL 3.0.

From OpenSSL 3.0 the PBKDF1 algorithm used in PKCS5_PBE_keyivgen() and PKCS5_PBE_keyivgen_ex() has been moved to the legacy provider as an EVP_KDF.

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