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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'EVP_PKEY_CTX_set_tls1_prf_md.3ossl' command

$ man EVP_PKEY_CTX_set_tls1_prf_md.3ossl

EVP_PKEY_CTX_SET_TLS1_PRF_MD(3ossl) OpenSSLEVP_PKEY_CTX_SET_TLS1_PRF_MD(3ossl)

NAME

EVP_PKEY_CTX_set_tls1_prf_md, EVP_PKEY_CTX_set1_tls1_prf_secret,

EVP_PKEY_CTX_add1_tls1_prf_seed - TLS PRF key derivation algorithm

SYNOPSIS

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

int EVP_PKEY_CTX_set_tls1_prf_md(EVP_PKEY_CTX *pctx, const EVP_MD *md);
int EVP_PKEY_CTX_set1_tls1_prf_secret(EVP_PKEY_CTX *pctx,
                                      unsigned char *sec, int seclen);
int EVP_PKEY_CTX_add1_tls1_prf_seed(EVP_PKEY_CTX *pctx,
                                    unsigned char *seed, int seedlen);
```

DESCRIPTION

The EVP_PKEY_TLS1_PRF algorithm implements the PRF key derivation function for TLS. It has no associated private key and only implements key derivation using EVP_PKEY_derive(3).

EVP_PKEY_set_tls1_prf_md() sets the message digest associated with the TLS PRF. EVP_md5_sha1() is treated as a special case which uses the PRF algorithm using both MD5 and SHA1 as used in TLS 1.0 and 1.1.

EVP_PKEY_CTX_set_tls1_prf_secret() sets the secret value of the TLS PRF to seclen bytes of the buffer sec. Any existing secret value is replaced and any seed is reset.

EVP_PKEY_CTX_add1_tls1_prf_seed() sets the seed to seedlen bytes of seed. If a seed is already set it is appended to the existing value.

STRING CTRLS

The TLS PRF also supports string based control operations using EVP_PKEY_CTX_ctrl_str(3). The type parameter "md" uses the supplied value as the name of the digest algorithm to use. The type parameters "secret" and "seed" use the supplied value parameter as a secret or seed value. The names "hexsecret" and "hexseed" are similar except they take a hex string which is converted to binary.

NOTES

A context for the TLS PRF can be obtained by calling:

```
EVP_PKEY_CTX *pctx = EVP_PKEY_CTX_new_id(EVP_PKEY_TLS1_PRF, NULL);
```

The digest, secret value and seed must be set before a key is derived or an error occurs.

The total length of all seeds cannot exceed 1024 bytes in length: this should be more than enough for any normal use of the TLS PRF.

The output length of the PRF is specified by the length parameter in the EVP_PKEY_derive() function. Since the output length is variable, setting the buffer to NULL is not meaningful for the TLS PRF.

Optimised versions of the TLS PRF can be implemented in an ENGINE.

RETURN VALUES

All these functions return 1 for success and 0 or a negative value for failure. In particular a return value of -2 indicates the operation is not supported by the public key algorithm.

EXAMPLES

This example derives 10 bytes using SHA-256 with the secret key "secret" and seed value "seed":

```
EVP_PKEY_CTX *pctx;
unsigned char out[10];
size_t outlen = sizeof(out);

pctx = EVP_PKEY_CTX_new_id(EVP_PKEY_TLS1_PRF, NULL);
if (EVP_PKEY_derive_init(pctx) <= 0)
    /* Error */
if (EVP_PKEY_CTX_set_tls1_prf_md(pctx, EVP_sha256()) <= 0)
    /* Error */
if (EVP_PKEY_CTX_set1_tls1_prf_secret(pctx, "secret", 6) <= 0)
    /* Error */
if (EVP_PKEY_CTX_add1_tls1_prf_seed(pctx, "seed", 4) <= 0)
    /* Error */
if (EVP_PKEY_derive(pctx, out, &outlen) <= 0)
    /* Error */
```

SEE ALSO

EVP_PKEY_CTX_new(3), EVP_PKEY_CTX_ctrl_str(3), EVP_PKEY_derive(3)

HISTORY

All of the functions described here were converted from macros to functions in OpenSSL 3.0.

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