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***Rocky Enterprise Linux 9.2 Manual Pages on command 'EVP\_SIGNATURE-ED448.7ssl'***

***\$ man EVP\_SIGNATURE-ED448.7ssl***

EVP\_SIGNATURE-ED25519(7SSL)      OpenSSL      EVP\_SIGNATURE-ED25519(7SSL)

**NAME**

EVP\_SIGNATURE-ED25519, EVP\_SIGNATURE-ED448, Ed25519, Ed448 - EVP\_PKEY Ed25519 and Ed448 support

**DESCRIPTION**

The Ed25519 and Ed448 EVP\_PKEY implementation supports key generation, one-shot digest sign and digest verify using PureEdDSA and Ed25519 or Ed448 (see RFC8032). It has associated private and public key formats compatible with RFC 8410.

**ED25519 and ED448 Signature Parameters**

No additional parameters can be set during one-shot signing or verification. In particular, because PureEdDSA is used, a digest must NOT be specified when signing or verifying. See EVP\_PKEY-X25519(7) for information related to X25519 and X448 keys.

The following signature parameters can be retrieved using EVP\_PKEY\_CTX\_get\_params().

"algorithm-id" (OSSL\_SIGNATURE\_PARAM\_ALGORITHM\_ID) <octet string>

The parameters are described in provider-signature(7).

**NOTES**

The PureEdDSA algorithm does not support the streaming mechanism of other signature

algorithms using, for example, `EVP_DigestUpdate()`. The message to sign or verify must be passed using the one-shot `EVP_DigestSign()` and `EVP_DigestVerify()` functions.

When calling `EVP_DigestSignInit()` or `EVP_DigestVerifyInit()`, the digest type parameter **MUST** be set to `NULL`.

Applications wishing to sign certificates (or other structures such as CRLs or certificate requests) using Ed25519 or Ed448 can either use `X509_sign()` or `X509_sign_ctx()` in the usual way.

Ed25519 or Ed448 private keys can be set directly using `EVP_PKEY_new_raw_private_key(3)` or loaded from a PKCS#8 private key file using `PEM_read_bio_PrivateKey(3)` (or similar function). Completely new keys can also be generated (see the example below). Setting a private key also sets the associated public key.

Ed25519 or Ed448 public keys can be set directly using `EVP_PKEY_new_raw_public_key(3)` or loaded from a `SubjectPublicKeyInfo` structure in a PEM file using `PEM_read_bio_PUBKEY(3)` (or similar function).

Ed25519 and Ed448 can be tested with the `openssl-speed(1)` application since version 1.1.1. Valid algorithm names are `ed25519`, `ed448` and `eddsa`. If `eddsa` is specified, then both Ed25519 and Ed448 are benchmarked.

## EXAMPLES

To sign a message using a ED25519 or ED448 key:

```
void do_sign(EVP_PKEY *ed_key, unsigned char *msg, size_t msg_len)
{
    size_t sig_len;
    unsigned char *sig = NULL;
    EVP_MD_CTX *md_ctx = EVP_MD_CTX_new();

    EVP_DigestSignInit(md_ctx, NULL, NULL, NULL, ed_key);
```

```
/* Calculate the requires size for the signature by passing a NULL buffer */
EVP_DigestSign(md_ctx, NULL, &sig_len, msg, msg_len);

sig = OPENSSL_zalloc(sig_len);

EVP_DigestSign(md_ctx, sig, &sig_len, msg, msg_len);

...

OPENSSL_free(sig);
EVP_MD_CTX_free(md_ctx);
}
```

#### SEE ALSO

EVP\_PKEY-X25519(7) provider-signature(7), EVP\_DigestSignInit(3), EVP\_DigestVerifyInit(3),

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2024-02-16

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