

**NAME**

EVP\_PKEY\_CTX\_new, EVP\_PKEY\_CTX\_new\_id, EVP\_PKEY\_CTX\_new\_from\_name,  
 EVP\_PKEY\_CTX\_new\_from\_pkey, EVP\_PKEY\_CTX\_dup, EVP\_PKEY\_CTX\_free,  
 EVP\_PKEY\_CTX\_is\_a - public key algorithm context functions

**SYNOPSIS**

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

```
EVP_PKEY_CTX *EVP_PKEY_CTX_new(EVP_PKEY *pkey, ENGINE *e);
EVP_PKEY_CTX *EVP_PKEY_CTX_new_id(int id, ENGINE *e);
EVP_PKEY_CTX *EVP_PKEY_CTX_new_from_name(OSSL_LIB_CTX *libctx,
    const char *name,
    const char *propquery);
EVP_PKEY_CTX *EVP_PKEY_CTX_new_from_pkey(OSSL_LIB_CTX *libctx,
    EVP_PKEY *pkey,
    const char *propquery);
EVP_PKEY_CTX *EVP_PKEY_CTX_dup(const EVP_PKEY_CTX *ctx);
void EVP_PKEY_CTX_free(EVP_PKEY_CTX *ctx);
int EVP_PKEY_CTX_is_a(EVP_PKEY_CTX *ctx, const char *keytype);
```

**DESCRIPTION**

The **EVP\_PKEY\_CTX\_new()** function allocates public key algorithm context using the *pkey* key type and ENGINE *e*.

The **EVP\_PKEY\_CTX\_new\_id()** function allocates public key algorithm context using the key type specified by *id* and ENGINE *e*.

The **EVP\_PKEY\_CTX\_new\_from\_name()** function allocates a public key algorithm context using the library context *libctx* (see **OSSL\_LIB\_CTX(3)**), the key type specified by *name* and the property query *propquery*. None of the arguments are duplicated, so they must remain unchanged for the lifetime of the returned **EVP\_PKEY\_CTX** or of any of its duplicates. Read further about the possible names in "NOTES" below.

The **EVP\_PKEY\_CTX\_new\_from\_pkey()** function allocates a public key algorithm context using the library context *libctx* (see **OSSL\_LIB\_CTX(3)**) and the algorithm specified by *pkey* and the property query *propquery*. None of the arguments are duplicated, so they must remain unchanged for the lifetime of the returned **EVP\_PKEY\_CTX** or any of its duplicates.

**EVP\_PKEY\_CTX\_new\_id()** and **EVP\_PKEY\_CTX\_new\_from\_name()** are normally used when no **EVP\_PKEY** structure is associated with the operations, for example during parameter generation or

key generation for some algorithms.

**EVP\_PKEY\_CTX\_dup()** duplicates the context *ctx*. It is not supported for a keygen operation.

**EVP\_PKEY\_CTX\_free()** frees up the context *ctx*. If *ctx* is NULL, nothing is done.

**EVP\_PKEY\_is\_a()** checks if the key type associated with *ctx* is *keytype*.

## NOTES

### On EVP\_PKEY\_CTX

The **EVP\_PKEY\_CTX** structure is an opaque public key algorithm context used by the OpenSSL high-level public key API. Contexts **MUST NOT** be shared between threads: that is it is not permissible to use the same context simultaneously in two threads.

### On Key Types

We mention "key type" in this manual, which is the same as "algorithm" in most cases, allowing either term to be used interchangeably. There are algorithms where the *key type* and the *algorithm* of the operations that use the keys are not the same, such as EC keys being used for ECDSA and ECDH operations.

Key types are given in two different manners:

Legacy NID or EVP\_PKEY type

This is the *id* used with **EVP\_PKEY\_CTX\_new\_id()**.

These are **EVP\_PKEY\_RSA**, **EVP\_PKEY\_RSA\_PSS**, **EVP\_PKEY\_DSA**, **EVP\_PKEY\_DH**, **EVP\_PKEY\_EC**, **EVP\_PKEY\_SM2**, **EVP\_PKEY\_X25519**, **EVP\_PKEY\_X448**, and are used by legacy methods.

Name strings

This is the *name* used with **EVP\_PKEY\_CTX\_new\_from\_name()**.

These are names like "RSA", "DSA", and what's available depends on what providers are currently accessible.

The OpenSSL providers offer a set of key types available this way, please see **OSSL\_PROVIDER-FIPS(7)** and **OSSL\_PROVIDER-default(7)** and related documentation for more information.

## RETURN VALUES

**EVP\_PKEY\_CTX\_new()**, **EVP\_PKEY\_CTX\_new\_id()** and **EVP\_PKEY\_CTX\_dup()** return either the newly allocated **EVP\_PKEY\_CTX** structure or **NULL** if an error occurred.

**EVP\_PKEY\_CTX\_free()** does not return a value.

**EVP\_PKEY\_CTX\_is\_a()** returns 1 for true and 0 for false.

## SEE ALSO

**EVP\_PKEY\_new(3)**

## HISTORY

The **EVP\_PKEY\_CTX\_new()**, **EVP\_PKEY\_CTX\_new\_id()**, **EVP\_PKEY\_CTX\_dup()** and **EVP\_PKEY\_CTX\_free()** functions were added in OpenSSL 1.0.0.

The **EVP\_PKEY\_CTX\_new\_from\_name()** and **EVP\_PKEY\_CTX\_new\_from\_pkey()** functions were added in OpenSSL 3.0.

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