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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'OSSL_PARAM_BLD_to_param.3oss!' command

```
$ man OSSL_PARAM_BLD_to_param.3oss!
```

```
OSSL_PARAM_BLD(3oss!)      OpenSSL      OSSL_PARAM_BLD(3oss!)
```

NAME

OSSL_PARAM_BLD, OSSL_PARAM_BLD_new, OSSL_PARAM_BLD_to_param, OSSL_PARAM_BLD_free, OSSL_PARAM_BLD_push_int, OSSL_PARAM_BLD_push_uint, OSSL_PARAM_BLD_push_long, OSSL_PARAM_BLD_push_ulong, OSSL_PARAM_BLD_push_int32, OSSL_PARAM_BLD_push_uint32, OSSL_PARAM_BLD_push_int64, OSSL_PARAM_BLD_push_uint64, OSSL_PARAM_BLD_push_size_t, OSSL_PARAM_BLD_push_time_t, OSSL_PARAM_BLD_push_double, OSSL_PARAM_BLD_push_BN, OSSL_PARAM_BLD_push_BN_pad, OSSL_PARAM_BLD_push_utf8_string, OSSL_PARAM_BLD_push_utf8_ptr, OSSL_PARAM_BLD_push_octet_string, OSSL_PARAM_BLD_push_octet_ptr - functions to assist in the creation of OSSL_PARAM arrays

SYNOPSIS

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

```
typedef struct OSSL_PARAM_BLD;
```

```
OSSL_PARAM_BLD *OSSL_PARAM_BLD_new(void);
```

```
OSSL_PARAM *OSSL_PARAM_BLD_to_param(OSSL_PARAM_BLD *bld);
```

```
void OSSL_PARAM_BLD_free(OSSL_PARAM_BLD *bld);
```

```
int OSSL_PARAM_BLD_push_TYPE(OSSL_PARAM_BLD *bld, const char *key, TYPE val);
```

```
int OSSL_PARAM_BLD_push_BN(OSSL_PARAM_BLD *bld, const char *key,  
    const BIGNUM *bn);
```

```
int OSSL_PARAM_BLD_push_BN_pad(OSSL_PARAM_BLD *bld, const char *key,  
    const BIGNUM *bn, size_t sz);
```

```
int OSSL_PARAM_BLD_push_utf8_string(OSSL_PARAM_BLD *bld, const char *key,  
    const char *buf, size_t bsize);
```

```
int OSSL_PARAM_BLD_push_utf8_ptr(OSSL_PARAM_BLD *bld, const char *key,  
    char *buf, size_t bsize);
```

```
int OSSL_PARAM_BLD_push_octet_string(OSSL_PARAM_BLD *bld, const char *key,  
    const void *buf, size_t bsize);
```

```
int OSSL_PARAM_BLD_push_octet_ptr(OSSL_PARAM_BLD *bld, const char *key,  
    void *buf, size_t bsize);
```

DESCRIPTION

A collection of utility functions that simplify the creation of OSSL_PARAM arrays. The TYPE names are as per OSSL_PARAM_int(3).

OSSL_PARAM_BLD_new() allocates and initialises a new OSSL_PARAM_BLD structure so that values can be added. Any existing values are cleared.

OSSL_PARAM_BLD_free() deallocates the memory allocated by OSSL_PARAM_BLD_new().

OSSL_PARAM_BLD_to_param() converts a built up OSSL_PARAM_BLD structure bld into an allocated OSSL_PARAM array. The OSSL_PARAM array and all associated storage must be freed by calling OSSL_PARAM_free() with the functions return value. OSSL_PARAM_BLD_free() can safely be called any time after this function is.

`OSSL_PARAM_BLD_push_TYPE()` are a series of functions which will create `OSSL_PARAM` objects of the specified size and correct type for the `val` argument. `val` is stored by value and an expression or auto variable can be used.

`OSSL_PARAM_BLD_push_BN()` is a function that will create an `OSSL_PARAM` object that holds the specified `BIGNUM` `bn`. If `bn` is marked as being securely allocated, its `OSSL_PARAM` representation will also be securely allocated. The `bn` argument is stored by reference and the underlying `BIGNUM` object must exist until after `OSSL_PARAM_BLD_to_param()` has been called.

`OSSL_PARAM_BLD_push_BN_pad()` is a function that will create an `OSSL_PARAM` object that holds the specified `BIGNUM` `bn`. The object will be padded to occupy exactly `sz` bytes, if insufficient space is specified an error results. If `bn` is marked as being securely allocated, its `OSSL_PARAM` representation will also be securely allocated. The `bn` argument is stored by reference and the underlying `BIGNUM` object must exist until after `OSSL_PARAM_BLD_to_param()` has been called.

`OSSL_PARAM_BLD_push_utf8_string()` is a function that will create an `OSSL_PARAM` object that references the UTF8 string specified by `buf`. The length of the string `bsize` should not include the terminating NUL byte. If it is zero then it will be calculated. The string that `buf` points to is stored by reference and must remain in scope until after `OSSL_PARAM_BLD_to_param()` has been called.

`OSSL_PARAM_BLD_push_octet_string()` is a function that will create an `OSSL_PARAM` object that references the octet string specified by `buf` and `<bsize>`. The memory that `buf` points to is stored by reference and must remain in scope until after `OSSL_PARAM_BLD_to_param()` has been called.

`OSSL_PARAM_BLD_push_utf8_ptr()` is a function that will create an `OSSL_PARAM` object that references the UTF8 string specified by `buf`. The length of the string `bsize` should not include the terminating NUL byte. If it is zero then it will be calculated. The string `buf` points to is stored by reference and must remain in scope until the `OSSL_PARAM` array is freed.

`OSSL_PARAM_BLD_push_octet_ptr()` is a function that will create an `OSSL_PARAM` object that references the octet string specified by `buf`. The memory `buf` points to is stored by reference and must remain in scope until the `OSSL_PARAM` array is freed.

RETURN VALUES

`OSSL_PARAM_BLD_new()` returns the allocated `OSSL_PARAM_BLD` structure, or `NULL` on error.

`OSSL_PARAM_BLD_to_param()` returns the allocated `OSSL_PARAM` array, or `NULL` on error.

All of the `OSSL_PARAM_BLD_push_TYPE` functions return 1 on success and 0 on error.

NOTES

`OSSL_PARAM_BLD_push_BN()` and `OSSL_PARAM_BLD_push_BN_pad()` currently only support nonnegative `BIGNUM`s. They return an error on negative `BIGNUM`s.

EXAMPLES

Both examples creating an `OSSL_PARAM` array that contains an RSA key.

For both, the predefined key variables are:

```
BIGNUM *n;      /* modulus */
```

```

unsigned int e;    /* public exponent */
BIGNUM *d;        /* private exponent */
BIGNUM *p, *q;    /* first two prime factors */
BIGNUM *dmp1, *dmq1; /* first two CRT exponents */
BIGNUM *iqmp;     /* first CRT coefficient */

```

Example 1

This example shows how to create an OSSL_PARAM array that contains an RSA private key.

```

OSSL_PARAM_BLD *bld = OSSL_PARAM_BLD_new();
OSSL_PARAM *params = NULL;

if (bld == NULL
    || !OSSL_PARAM_BLD_push_BN(bld, "n", n)
    || !OSSL_PARAM_BLD_push_uint(bld, "e", e)
    || !OSSL_PARAM_BLD_push_BN(bld, "d", d)
    || !OSSL_PARAM_BLD_push_BN(bld, "rsa-factor1", p)
    || !OSSL_PARAM_BLD_push_BN(bld, "rsa-factor2", q)
    || !OSSL_PARAM_BLD_push_BN(bld, "rsa-exponent1", dmp1)
    || !OSSL_PARAM_BLD_push_BN(bld, "rsa-exponent2", dmq1)
    || !OSSL_PARAM_BLD_push_BN(bld, "rsa-coefficient1", iqmp)
    || (params = OSSL_PARAM_BLD_to_param(bld)) == NULL)
    goto err;

OSSL_PARAM_BLD_free(bld);

/* Use params */

...

OSSL_PARAM_free(params);

```

Example 2

This example shows how to create an OSSL_PARAM array that contains an RSA public key.

```
OSSL_PARAM_BLD *bld = OSSL_PARAM_BLD_new();
OSSL_PARAM *params = NULL;

if (nld == NULL
    || !OSSL_PARAM_BLD_push_BN(bld, "n", n)
    || !OSSL_PARAM_BLD_push_uint(bld, "e", e)
    || (params = OSSL_PARAM_BLD_to_param(bld)) == NULL)
    goto err;

OSSL_PARAM_BLD_free(bld);

/* Use params */

...

OSSL_PARAM_free(params);
```

SEE ALSO

OSSL_PARAM_int(3), OSSL_PARAM(3), OSSL_PARAM_free(3)

HISTORY

The functions described here were all added in OpenSSL 3.0.

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