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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'BN_RECP_CTX_set.3oss1' command

\$ man BN_RECP_CTX_set.3oss1

BN_MOD_MUL_RECIPROCAL(3oss1) OpenSSL BN_MOD_MUL_RECIPROCAL(3oss1)

NAME

BN_mod_mul_reciprocal, BN_div_rec, BN_RECP_CTX_new, BN_RECP_CTX_free,
BN_RECP_CTX_set - modular multiplication using reciprocal

SYNOPSIS

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

```
BN_RECP_CTX *BN_RECP_CTX_new(void);
```

```
void BN_RECP_CTX_free(BN_RECP_CTX *recp);
```

```
int BN_RECP_CTX_set(BN_RECP_CTX *recp, const BIGNUM *m, BN_CTX *ctx);
```

```
int BN_div_rec(BIGNUM *dv, BIGNUM *rem, const BIGNUM *a, BN_RECP_CTX *recp,  
BN_CTX *ctx);
```

```
int BN_mod_mul_reciprocal(BIGNUM *r, const BIGNUM *a, const BIGNUM *b,  
BN_RECP_CTX *recp, BN_CTX *ctx);
```

DESCRIPTION

BN_mod_mul_reciprocal() can be used to perform an efficient

BN_mod_mul(3) operation when the operation will be performed repeatedly

with the same modulus. It computes $r=(a*b)\%m$ using $\text{recp}=1/m$, which is set as described below. `ctx` is a previously allocated `BN_CTX` used for temporary variables.

`BN_RECP_CTX_new()` allocates and initializes a `BN_RECP` structure.

`BN_RECP_CTX_free()` frees the components of the `BN_RECP`, and, if it was created by `BN_RECP_CTX_new()`, also the structure itself. If `recp` is `NULL`, nothing is done.

`BN_RECP_CTX_set()` stores `m` in `recp` and sets it up for computing $1/m$ and shifting it left by `BN_num_bits(m)+1` to make it an integer. The result and the number of bits it was shifted left will later be stored in `recp`.

`BN_div_recip()` divides `a` by `m` using `recp`. It places the quotient in `dv` and the remainder in `rem`.

The `BN_RECP_CTX` structure cannot be shared between threads.

RETURN VALUES

`BN_RECP_CTX_new()` returns the newly allocated `BN_RECP_CTX`, and `NULL` on error.

`BN_RECP_CTX_free()` has no return value.

For the other functions, 1 is returned for success, 0 on error. The error codes can be obtained by `ERR_get_error(3)`.

SEE ALSO

`ERR_get_error(3)`, `BN_add(3)`, `BN_CTX_new(3)`

BN_RECP_CTX_init() was removed in OpenSSL 1.1.0

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