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

$ man BN_mod_mul_reciprocal.3ossl

BN_MOD_MUL_RECIPROCAL(3ossl) OpenSSL BN_MOD_MUL_RECIPROCAL(3ossl)

NAME

BN_mod_mul_reciprocal, BN_div_recp, 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_recp(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 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_recp() 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)

HISTORY

BN_RECP_CTX_init() was removed in OpenSSL 1.1.0

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