

NAME

BN_BLINDING_new, BN_BLINDING_free, BN_BLINDING_update, BN_BLINDING_convert,
 BN_BLINDING_invert, BN_BLINDING_convert_ex, BN_BLINDING_invert_ex,
 BN_BLINDING_is_current_thread, BN_BLINDING_set_current_thread, BN_BLINDING_lock,
 BN_BLINDING_unlock, BN_BLINDING_get_flags, BN_BLINDING_set_flags,
 BN_BLINDING_create_param – blinding related BIGNUM functions

SYNOPSIS

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

```
BN_BLINDING *BN_BLINDING_new(const BIGNUM *A, const BIGNUM *Ai,  
                             BIGNUM *mod);  
void BN_BLINDING_free(BN_BLINDING *b);  
int BN_BLINDING_update(BN_BLINDING *b, BN_CTX *ctx);  
int BN_BLINDING_convert(BIGNUM *n, BN_BLINDING *b, BN_CTX *ctx);  
int BN_BLINDING_invert(BIGNUM *n, BN_BLINDING *b, BN_CTX *ctx);  
int BN_BLINDING_convert_ex(BIGNUM *n, BIGNUM *r, BN_BLINDING *b,  
                           BN_CTX *ctx);  
int BN_BLINDING_invert_ex(BIGNUM *n, const BIGNUM *r, BN_BLINDING *b,  
                          BN_CTX *ctx);  
int BN_BLINDING_is_current_thread(BN_BLINDING *b);  
void BN_BLINDING_set_current_thread(BN_BLINDING *b);  
int BN_BLINDING_lock(BN_BLINDING *b);  
int BN_BLINDING_unlock(BN_BLINDING *b);  
unsigned long BN_BLINDING_get_flags(const BN_BLINDING *b);  
void BN_BLINDING_set_flags(BN_BLINDING *b, unsigned long flags);  
BN_BLINDING *BN_BLINDING_create_param(BN_BLINDING *b,  
                                       const BIGNUM *e, BIGNUM *m, BN_CTX *ctx,  
                                       int (*bn_mod_exp)(BIGNUM *r,  
                                                         const BIGNUM *a,  
                                                         const BIGNUM *p,  
                                                         const BIGNUM *m,  
                                                         BN_CTX *ctx,  
                                                         BN_MONT_CTX *m_ctx),  
                                       BN_MONT_CTX *m_ctx);
```

DESCRIPTION

BN_BLINDING_new() allocates a new **BN_BLINDING** structure and copies the **A** and **Ai** values into the newly created **BN_BLINDING** object.

BN_BLINDING_free() frees the **BN_BLINDING** structure. If **b** is NULL, nothing is done.

BN_BLINDING_update() updates the **BN_BLINDING** parameters by squaring the **A** and **Ai** or, after specific number of uses and if the necessary parameters are set, by re-creating the blinding parameters.

BN_BLINDING_convert_ex() multiplies **n** with the blinding factor **A**. If **r** is not NULL a copy of the inverse blinding factor **Ai** will be returned in **r** (this is useful if a **RSA** object is shared among several threads). **BN_BLINDING_invert_ex()** multiplies **n** with the inverse blinding factor **Ai**. If **r** is not NULL it will be used as the inverse blinding.

BN_BLINDING_convert() and **BN_BLINDING_invert()** are wrapper functions for **BN_BLINDING_convert_ex()** and **BN_BLINDING_invert_ex()** with **r** set to NULL.

BN_BLINDING_is_current_thread() returns whether the **BN_BLINDING** structure is owned by the current thread. This is to help users provide proper locking if needed for multi-threaded use.

BN_BLINDING_set_current_thread() sets the current thread as the owner of the **BN_BLINDING** structure.

BN_BLINDING_lock() locks the **BN_BLINDING** structure.

BN_BLINDING_unlock() unlocks the **BN_BLINDING** structure.

BN_BLINDING_get_flags() returns the **BN_BLINDING** flags. Currently there are two supported flags: **BN_BLINDING_NO_UPDATE** and **BN_BLINDING_NO_RECREATE**. **BN_BLINDING_NO_UPDATE** inhibits the automatic update of the **BN_BLINDING** parameters after each use and **BN_BLINDING_NO_RECREATE** inhibits the automatic re-creation of the **BN_BLINDING** parameters after a fixed number of uses (currently 32). In newly allocated **BN_BLINDING** objects no flags are set. **BN_BLINDING_set_flags()** sets the **BN_BLINDING** parameters flags.

BN_BLINDING_create_param() creates new **BN_BLINDING** parameters using the exponent **e** and the modulus **m**. **bn_mod_exp** and **m_ctx** can be used to pass special functions for exponentiation (normally **BN_mod_exp_mont()** and **BN_MONT_CTX**).

RETURN VALUES

BN_BLINDING_new() returns the newly allocated **BN_BLINDING** structure or NULL in case of an error.

BN_BLINDING_update(), **BN_BLINDING_convert()**, **BN_BLINDING_invert()**, **BN_BLINDING_convert_ex()** and **BN_BLINDING_invert_ex()** return 1 on success and 0 if an error occurred.

BN_BLINDING_is_current_thread() returns 1 if the current thread owns the **BN_BLINDING** object, 0 otherwise.

BN_BLINDING_set_current_thread() doesn't return anything.

BN_BLINDING_lock(), **BN_BLINDING_unlock()** return 1 if the operation succeeded or 0 on error.

BN_BLINDING_get_flags() returns the currently set **BN_BLINDING** flags (a **unsigned long** value).

BN_BLINDING_create_param() returns the newly created **BN_BLINDING** parameters or NULL on error.

HISTORY

BN_BLINDING_thread_id() was first introduced in OpenSSL 1.0.0, and it deprecates **BN_BLINDING_set_thread_id()** and **BN_BLINDING_get_thread_id()**.

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