

**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 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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