

**NAME**

DH\_generate\_parameters\_ex, DH\_generate\_parameters, DH\_check - generate and check Diffie-Hellman parameters

**SYNOPSIS**

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

```
int DH_generate_parameters_ex(DH *dh, int prime_len, int generator, BN_GENCB *cb);
```

```
int DH_check(DH *dh, int *codes);
```

Deprecated:

```
DH *DH_generate_parameters(int prime_len, int generator,
void (*callback)(int, int, void *), void *cb_arg);
```

**DESCRIPTION**

*DH\_generate\_parameters\_ex()* generates Diffie-Hellman parameters that can be shared among a group of users, and stores them in the provided **DH** structure. The pseudo-random number generator must be seeded prior to calling *DH\_generate\_parameters()*.

**prime\_len** is the length in bits of the safe prime to be generated. **generator** is a small number > 1, typically 2 or 5.

A callback function may be used to provide feedback about the progress of the key generation. If **cb** is not **NULL**, it will be called as described in *BN\_generate\_prime(3)* while a random prime number is generated, and when a prime has been found, **BN\_GENCB\_call(cb, 3, 0)** is called. See *BN\_generate\_prime(3)* for information on the *BN\_GENCB\_call()* function.

*DH\_check()* validates Diffie-Hellman parameters. It checks that **p** is a safe prime, and that **g** is a suitable generator. In the case of an error, the bit flags **DH\_CHECK\_P\_NOT\_SAFE\_PRIME** or **DH\_NOT\_SUITABLE\_GENERATOR** are set in **\*codes**. **DH\_UNABLE\_TO\_CHECK\_GENERATOR** is set if the generator cannot be checked, i.e. it does not equal 2 or 5.

**RETURN VALUES**

*DH\_generate\_parameters\_ex()* and *DH\_check()* return 1 if the check could be performed, 0 otherwise.

*DH\_generate\_parameters()* (deprecated) returns a pointer to the DH structure, or **NULL** if the parameter generation fails.

The error codes can be obtained by *ERR\_get\_error(3)*.

**NOTES**

*DH\_generate\_parameters\_ex()* and *DH\_generate\_parameters()* may run for several hours before finding a suitable prime.

The parameters generated by *DH\_generate\_parameters\_ex()* and *DH\_generate\_parameters()* are not to be used in signature schemes.

**BUGS**

If **generator** is not 2 or 5, **dh->g=generator** is not a usable generator.

**SEE ALSO**

*dh(3)*, *ERR\_get\_error(3)*, *rand(3)*, *DH\_free(3)*

**HISTORY**

*DH\_check()* is available in all versions of SSLeay and OpenSSL. The **cb\_arg** argument to *DH\_generate\_parameters()* was added in SSLeay 0.9.0.

In versions before OpenSSL 0.9.5, **DH\_CHECK\_P\_NOT\_STRONG\_PRIME** is used instead of **DH\_CHECK\_P\_NOT\_SAFE\_PRIME**.