

NAME

OSSL_SELF_TEST_new, OSSL_SELF_TEST_free, OSSL_SELF_TEST_onbegin, OSSL_SELF_TEST_oncorrupt_byte, OSSL_SELF_TEST_onend - functionality to trigger a callback during a self test

SYNOPSIS

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

```
OSSL_SELF_TEST *OSSL_SELF_TEST_new(OSSL_CALLBACK *cb, void *cbarg);  
void OSSL_SELF_TEST_free(OSSL_SELF_TEST *st);
```

```
void OSSL_SELF_TEST_onbegin(OSSL_SELF_TEST *st, const char *type,  
                             const char *desc);
```

```
int OSSL_SELF_TEST_oncorrupt_byte(OSSL_SELF_TEST *st, unsigned char *bytes);
```

```
void OSSL_SELF_TEST_onend(OSSL_SELF_TEST *st, int ret);
```

DESCRIPTION

These methods are intended for use by provider implementers, to display diagnostic information during self testing.

OSSL_SELF_TEST_new() allocates an opaque **OSSL_SELF_TEST** object that has a callback and callback argument associated with it.

The callback *cb* may be triggered multiple times by a self test to indicate different phases.

OSSL_SELF_TEST_free() frees the space allocated by **OSSL_SELF_TEST_new()**.

OSSL_SELF_TEST_onbegin() may be inserted at the start of a block of self test code. It can be used for diagnostic purposes. If this method is called the callback *cb* will receive the following **OSSL_PARAM(3)** object.

"st-phase" (**OSSL_PROV_PARAM_SELF_TEST_PHASE**) <UTF8 string>

The value is the string "Start"

OSSL_SELF_TEST_oncorrupt_byte() may be inserted just after the known answer is calculated, but before the self test compares the result. The first byte in the passed in array of *bytes* will be corrupted if the callback returns 0, otherwise it leaves the array unaltered. It can be used for failure testing. The *type* and *desc* can be used to identify an individual self test to target for failure testing. If this method is called the callback *cb* will receive the following **OSSL_PARAM(3)** object.

"st-phase" (**OSSL_PROV_PARAM_SELF_TEST_PHASE**) <UTF8 string>

The value is the string "Corrupt"

OSSL_SELF_TEST_onend() may be inserted at the end of a block of self test code just before cleanup to indicate if the test passed or failed. It can be used for diagnostic purposes. If this method is called the callback *cb* will receive the following **OSSL_PARAM(3)** object.

"st-phase" (**OSSL_PROV_PARAM_SELF_TEST_PHASE**) <UTF8 string>

The value of the string is "Pass" if *ret* is non zero, otherwise it has the value "Fail".

After the callback *cb* has been called the values that were set by **OSSL_SELF_TEST_onbegin()** for *type* and *desc* are set to the value "None".

If **OSSL_SELF_TEST_onbegin()**, **OSSL_SELF_TEST_oncorrupt_byte()** or **OSSL_SELF_TEST_onend()** is called the following additional **OSSL_PARAM(3)** are passed to the callback.

"st-type" (**OSSL_PROV_PARAM_SELF_TEST_TYPE**) <UTF8 string>

The value is setup by the *type* passed to **OSSL_SELF_TEST_onbegin()**. This allows the callback to identify the type of test being run.

"st-desc" (**OSSL_PROV_PARAM_SELF_TEST_DESC**) <UTF8 string>

The value is setup by the *type* passed to **OSSL_SELF_TEST_onbegin()**. This allows the callback to identify the sub category of the test being run.

RETURN VALUES

OSSL_SELF_TEST_new() returns the allocated **OSSL_SELF_TEST** object, or NULL if it fails.

OSSL_SELF_TEST_oncorrupt_byte() returns 1 if corruption occurs, otherwise it returns 0.

EXAMPLES

A single self test could be set up in the following way:

```
OSSL_SELF_TEST *st = NULL;
OSSL_CALLBACK *cb;
void *cbarg;
int ok = 0;
unsigned char out[EVP_MAX_MD_SIZE];
unsigned int out_len = 0;
EVP_MD_CTX *ctx = EVP_MD_CTX_new();
```

```

EVP_MD *md = EVP_MD_fetch(libctx, t->algorithm, NULL);

/*
 * Retrieve the callback - will be NULL if not set by the application via
 * OSSL_SELF_TEST_set_callback().
 */
OSSL_SELF_TEST_get_callback(libctx, &cb, &cbarg);

st = OSSL_SELF_TEST_new(cb, cb_arg);

/* Trigger the optional callback */
OSSL_SELF_TEST_onbegin(st, OSSL_SELF_TEST_TYPE_KAT_DIGEST,
                       OSSL_SELF_TEST_DESC_MD_SHA2);

if (!EVP_DigestInit_ex(ctx, md, NULL)
    || !EVP_DigestUpdate(ctx, pt, pt_len)
    || !EVP_DigestFinal(ctx, out, &out_len))
    goto err;

/* Optional corruption - If the application callback returns 0 */
OSSL_SELF_TEST_oncorrupt_byte(st, out);

if (out_len != t->expected_len
    || memcmp(out, t->expected, out_len) != 0)
    goto err;
ok = 1;
err:
OSSL_SELF_TEST_onend(st, ok);
EVP_MD_free(md);
EVP_MD_CTX_free(ctx);

```

Multiple self test's can be set up in a similar way by repeating the pattern of **OSSL_SELF_TEST_onbegin()**, **OSSL_SELF_TEST_oncorrupt_byte()**, **OSSL_SELF_TEST_onend()** for each test.

SEE ALSO

OSSL_SELF_TEST_set_callback(3), **openssl-core.h(7)**, **OSSL_PROVIDER-FIPS(7)**

HISTORY

The functions described here were added in OpenSSL 3.0.

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