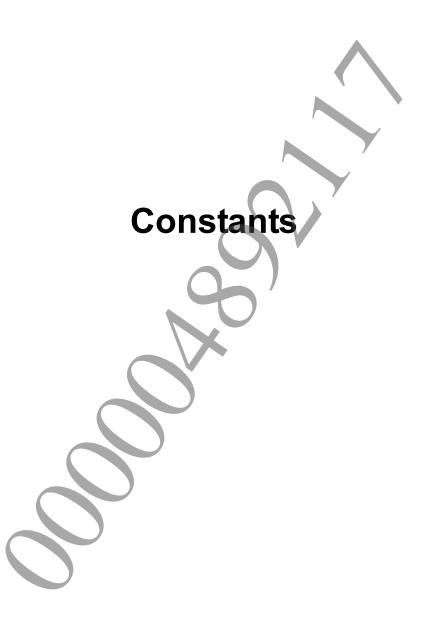


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## SCE SFMT216091 ARRAY SIZE

Array size for SFMT216091 pseudo random number calculation

#### **Definition**

```
#include <libsfmt216091.h>
#define SCE SFMT216091 ARRAY SIZE
                                           /* (216091 / 128) + 1 */
                                    1689
```

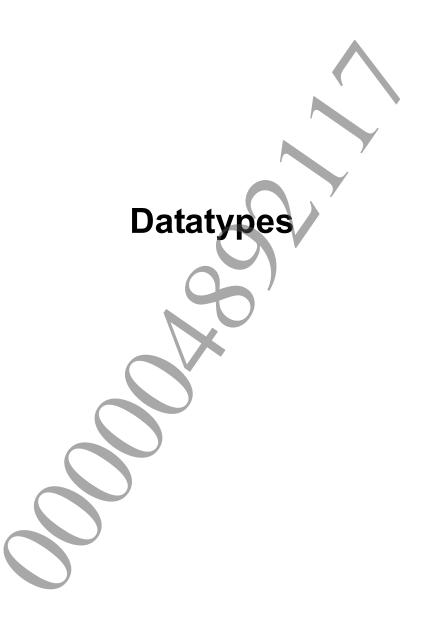
#### **Description**

This constant defines the array size for pseudo random numbers in conformance with SFMT216091. In addition to indicating the array size that is maintained as state in the SoeSfmt216091Context structure, this constant is also used by the sceSfmt216091FillArray32() and sceSfmt216091FillArray64() functions to indicate the minimum size for generating random numbers.

#### See Also

SceSfmt216091Context, sceSfmt216091FillArray32(), sceSfmt216091FillArray64()





## SceSfmt216091Context

Context information for SFMT216091 pseudo random number calculation

#### **Definition**

```
#include <libsfmt216091.h>
typedef struct SceSfmt216091Context {
          unsigned int idx;
          unsigned int sfmt[SCE_SFMT216091_ARRAY_SIZE][4];
} SceSfmt216091Context;
```

#### **Description**

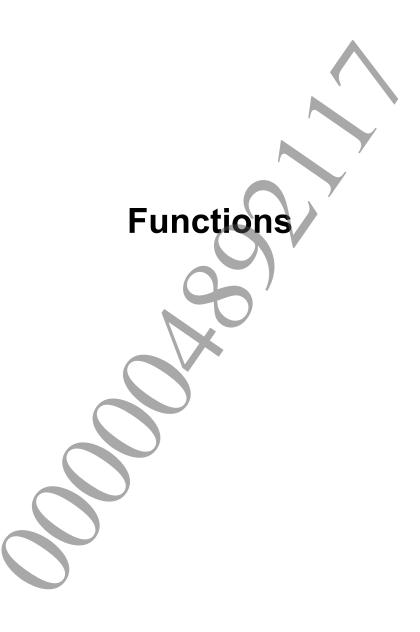
This structure is a work area for calculating pseudo random numbers in conformance with SFMT216091

One instance of this work area must be prepared for each random number sequence.

#### See Also

SCE\_SFMT216091\_ARRAY\_SIZE, sceSfmt216091InitGenRand(),
sceSfmt216091InitByArray()





## sceSfmt216091InitGenRand

Initialize SFMT216091 pseudo random number work area

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

PCtx Pointer to an SceSfmt216091Context structure, which represents a random number sequence as a context.

Seed Specifies a random number sequence.

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE OK	Normal completion

#### **Description**

This function uses a 32-bit seed to initialize an SFMT216091 random number sequence, which is represented by the SceSfmt216091Context structure. This function must be executed before the sceSfmt216091GenRand32(), sceSfmt216091GenRand64(), sceSfmt216091FillArray32(), and sceSfmt216091FillArray64() functions.

Since only the SceSfmt216091Context structure indicated by pCtx is initialized, multiple random number sequences can be handled simultaneously by having multiple SceSfmt216091Context structures.

#### See Also

SceSfmt216091Context, sceSfmt216091InitByArray()

# sceSfmt216091InitByArray

Initialize SFMT216091 pseudo random number work area

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

Pointer to an SceSfmt216091Context structure, which represents a random number sequence as a context.

initkey
keylength
Number of elements in initkey.

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE_OK	Normal completion

#### **Description**

This function uses an array of 32-bit seeds to initialize an SFMT216091 random number sequence, which is represented by the SceSfmt216091Context structure. This function must be executed before the sceSfmt216091GenRand32(), sceSfmt216091GenRand64(), sceSfmt216091FillArray32(), and sceSfmt216091FillArray64() functions.

Since only the SceSfmt216091Context structure indicated by pCtx is initialized, multiple random number sequences can be handled simultaneously by having multiple SceSfmt216091Context structures.

#### See Also

SceSfmt216091Context, sceSfmt216091InitGenRand()

# Document serial number: 000004892117

## sceSfmt216091GenRand32

Generate an SFMT216091 32-bit pseudo random number

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

Pointer to an SceSfmt216091Context structure, which represents a random number sequence as a context.

#### **Return Values**

32-bit pseudo random number

#### **Description**

This function generates a 32-bit pseudo random number that conforms to SFMT216091.

Before using this function, the SceSfmt216091Context structure must be initialized by calling the sceSfmt216091InitGenRand() or sceSfmt216091InitByArray() functions.

#### See Also

SceSfmt216091Context, sceSfmt216091InitGenRand(), sceSfmt216091InitByArray()

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## sceSfmt216091GenRand64

Generate an SFMT216091 64-bit pseudo random number

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

*pCtx* Pointer to an SceSfmt216091Context structure, which represents a random number sequence as a context.

#### **Return Values**

64-bit pseudo random number

#### **Description**

This function generates a 64-bit pseudo random number that conforms to SFMT216091.

Before using this function, the SceSfmt216091Context structure must be initialized by calling the sceSfmt216091InitGenRand() or sceSfmt216091InitByArray() functions.

Note that if the sceSfmt216091GenRand32() and sceSfmt216091GenRand64() functions are used together and the sceSfmt216091GenRand64() function is called after the sceSfmt216091GenRand32() function has been called an odd number of times, a full 64-bit random number will not be obtained. Instead, this function will return a 64-bit value in which the upper 32 bits are zero.

#### See Also

SceSfmt216091Context, sceSfmt216091InitGenRand(), sceSfmt216091InitByArray()

# sceSfmt216091FillArray32

Generate an array of SFMT216091 32-bit pseudo random numbers

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

```
Pointer to an SceSfmt216091Context structure, which represents a random number sequence as a context.

array Buffer for receiving the generated random numbers
Size Number of elements in array (multiple of 4 that is larger than SCE_SFMT216091_ARRAY_SIZE*4)
```

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE_OK	Normal completion

#### Description

This function generates an arbitrary number of 32-bit pseudo random numbers that conform to SFMT216091. *size* specifies the number of elements in *array* and must be a multiple of 4 that is larger than (SCE SFMT216091 ARRAY SIZE \* 4).

Before using this function, the SceSfmt216091Context structure must be initialized by calling the sceSfmt216091InitGenRand() or sceSfmt216091InitByArray() functions.

When the sceSfmt216091FillArray32() function is used together with the sceSfmt216091GenRand32() function, the sceSfmt216091FillArray32() function can be called only after the sceSfmt216091GenRand32() function has been called (SCE SFMT216091 ARRAY SIZE \* 4) times.

When the sceSfmt216091FillArray32() function is used together with the sceSfmt216091GenRand64() function, the sceSfmt216091FillArray32() function can be called only after the sceSfmt216091GenRand64() function has been called (SCE\_SFMT216091\_ARRAY\_SIZE \* 2) times.

#### See Also

SceSfmt216091Context, sceSfmt216091InitGenRand(), sceSfmt216091InitByArray()

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# sceSfmt216091FillArray64

Generate an array of SFMT216091 64-bit pseudo random numbers

#### **Definition**

#### **Calling Conditions**

Multithread safe

#### **Arguments**

```
Pointer to an SceSfmt216091Context structure, which represents a random number sequence as a context.

array Buffer for receiving the generated random numbers
Size Number of elements in array (multiple of 2 that is larger than
SCE_SFMT216091_ARRAY_SIZE*2)
```

#### **Return Values**

If an error occurs, a negative value is returned.

Value	
SCE_OK	Normal completion

#### Description

This function generates an arbitrary number of 64-bit pseudo random numbers that conform to SFMT216091. *size* specifies the number of elements in *array* and must be a multiple of 2 that is larger than (SCE SFMT216091 ARRAY SIZE \* 2).

Before using this function, the SceSfmt216091Context structure must be initialized by calling the sceSfmt216091InitGenRand() or sceSfmt216091InitByArray() functions.

When the sceSfmt216091FillArray64() function is used together with the sceSfmt216091GenRand32() function, the sceSfmt216091FillArray64() function can be called only after the sceSfmt216091GenRand32() function has been called (SCE SFMT216091 ARRAY SIZE \* 4) times.

When the sceSfmt216091FillArray64() function is used together with the sceSfmt216091GenRand64() function, the sceSfmt216091FillArray64() function can be called only after the sceSfmt216091GenRand64() function has been called (SCE\_SFMT216091\_ARRAY\_SIZE \* 2) times.

#### See Also

SceSfmt216091Context, sceSfmt216091InitGenRand(), sceSfmt216091InitByArray()

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