

**NAME**

OSSL\_PROVIDER\_set\_default\_search\_path, OSSL\_PROVIDER, OSSL\_PROVIDER\_load, OSSL\_PROVIDER\_try\_load, OSSL\_PROVIDER\_unload, OSSL\_PROVIDER\_available, OSSL\_PROVIDER\_do\_all, OSSL\_PROVIDER\_gettable\_params, OSSL\_PROVIDER\_get\_params, OSSL\_PROVIDER\_query\_operation, OSSL\_PROVIDER\_unquery\_operation, OSSL\_PROVIDER\_get0\_provider\_ctx, OSSL\_PROVIDER\_get0\_dispatch, OSSL\_PROVIDER\_add\_builtin, OSSL\_PROVIDER\_get0\_name, OSSL\_PROVIDER\_get\_capabilities, OSSL\_PROVIDER\_self\_test - provider routines

**SYNOPSIS**

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

```
typedef struct ossl_provider_st OSSL_PROVIDER;
```

```
int OSSL_PROVIDER_set_default_search_path(OSSL_LIB_CTX *libctx,
                                         const char *path);
```

```
OSSL_PROVIDER *OSSL_PROVIDER_load(OSSL_LIB_CTX *libctx, const char *name);
OSSL_PROVIDER *OSSL_PROVIDER_try_load(OSSL_LIB_CTX *libctx, const char *name,
                                       int retain_fallbacks);
```

```
int OSSL_PROVIDER_unload(OSSL_PROVIDER *prov);
int OSSL_PROVIDER_available(OSSL_LIB_CTX *libctx, const char *name);
int OSSL_PROVIDER_do_all(OSSL_LIB_CTX *ctx,
                        int (*cb)(OSSL_PROVIDER *provider, void *cbdata),
                        void *cbdata);
```

```
const OSSL_PARAM *OSSL_PROVIDER_gettable_params(OSSL_PROVIDER *prov);
int OSSL_PROVIDER_get_params(OSSL_PROVIDER *prov, OSSL_PARAM params[]);
```

```
const OSSL_ALGORITHM *OSSL_PROVIDER_query_operation(const OSSL_PROVIDER *prov,
                                                    int operation_id,
                                                    int *no_cache);
```

```
void OSSL_PROVIDER_unquery_operation(const OSSL_PROVIDER *prov,
                                    int operation_id,
                                    const OSSL_ALGORITHM *algs);
```

```
void *OSSL_PROVIDER_get0_provider_ctx(const OSSL_PROVIDER *prov);
const OSSL_DISPATCH *OSSL_PROVIDER_get0_dispatch(const OSSL_PROVIDER *prov);
```

```
int OSSL_PROVIDER_add_builtin(OSSL_LIB_CTX *libctx, const char *name,
                              ossl_provider_init_fn *init_fn);
```

```
const char *OSSL_PROVIDER_get0_name(const OSSL_PROVIDER *prov);

int OSSL_PROVIDER_get_capabilities(const OSSL_PROVIDER *prov,
    const char *capability,
    OSSL_CALLBACK *cb,
    void *arg);

int OSSL_PROVIDER_self_test(const OSSL_PROVIDER *prov);
```

## DESCRIPTION

**OSSL\_PROVIDER** is a type that holds internal information about implementation providers (see **provider(7)** for information on what a provider is). A provider can be built in to the application or the OpenSSL libraries, or can be a loadable module. The functions described here handle both forms.

Some of these functions operate within a library context, please see **OSSL\_LIB\_CTX(3)** for further details.

## Functions

**OSSL\_PROVIDER\_set\_default\_search\_path()** specifies the default search *path* that is to be used for looking for providers in the specified *libctx*. If left unspecified, an environment variable and a fallback default value will be used instead.

**OSSL\_PROVIDER\_add\_builtin()** is used to add a built in provider to **OSSL\_PROVIDER** store in the given library context, by associating a provider name with a provider initialization function. This name can then be used with **OSSL\_PROVIDER\_load()**.

**OSSL\_PROVIDER\_load()** loads and initializes a provider. This may simply initialize a provider that was previously added with **OSSL\_PROVIDER\_add\_builtin()** and run its given initialization function, or load a provider module with the given name and run its provider entry point, "OSSL\_provider\_init". The *name* can be a path to a provider module, in that case the provider name as returned by **OSSL\_PROVIDER\_get0\_name()** will be the path. Interpretation of relative paths is platform dependent and they are relative to the configured "MODULESDIR" directory or the path set in the environment variable OPENSSL\_MODULES if set.

**OSSL\_PROVIDER\_try\_load()** functions like **OSSL\_PROVIDER\_load()**, except that it does not disable the fallback providers if the provider cannot be loaded and initialized or if *retain\_fallbacks* is nonzero. If the provider loads successfully and *retain\_fallbacks* is zero, the fallback providers are disabled.

**OSSL\_PROVIDER\_unload()** unloads the given provider. For a provider added with **OSSL\_PROVIDER\_add\_builtin()**, this simply runs its teardown function.

**OSSL\_PROVIDER\_available()** checks if a named provider is available for use.

**OSSL\_PROVIDER\_do\_all()** iterates over all loaded providers, calling *cb* for each one, with the current provider in *provider* and the *cbdata* that comes from the caller. If no other provider has been loaded before calling this function, the default provider is still available as fallback. See **OSSL\_PROVIDER-default(7)** for more information on this fallback behaviour.

**OSSL\_PROVIDER\_gettable\_params()** is used to get a provider parameter descriptor set as a constant **OSSL\_PARAM(3)** array.

**OSSL\_PROVIDER\_get\_params()** is used to get provider parameter values. The caller must prepare the **OSSL\_PARAM(3)** array before calling this function, and the variables acting as buffers for this parameter array should be filled with data when it returns successfully.

**OSSL\_PROVIDER\_self\_test()** is used to run a provider's self tests on demand. If the self tests fail then the provider will fail to provide any further services and algorithms.

**OSSL\_SELF\_TEST\_set\_callback(3)** may be called beforehand in order to display diagnostics for the running self tests.

**OSSL\_PROVIDER\_query\_operation()** calls the provider's *query\_operation* function (see **provider(7)**), if the provider has one. It returns an array of **OSSL\_ALGORITHM** for the given *operation\_id* terminated by an all NULL **OSSL\_ALGORITHM** entry. This is considered a low-level function that most applications should not need to call.

**OSSL\_PROVIDER\_unquery\_operation()** calls the provider's *unquery\_operation* function (see **provider(7)**), if the provider has one. This is considered a low-level function that most applications should not need to call.

**OSSL\_PROVIDER\_get0\_provider\_ctx()** returns the provider context for the given provider. The provider context is an opaque handle set by the provider itself and is passed back to the provider by **libcrypto** in various function calls.

**OSSL\_PROVIDER\_get0\_dispatch()** returns the provider's dispatch table as it was returned in the *out* parameter from the provider's init function. See **provider-base(7)**.

If it is permissible to cache references to this array then *\*no\_store* is set to 0 or 1 otherwise. If the array is not cacheable then it is assumed to have a short lifetime.

**OSSL\_PROVIDER\_get0\_name()** returns the name of the given provider.

**OSSL\_PROVIDER\_get\_capabilities()** provides information about the capabilities supported by the provider specified in *prov* with the capability name *capability*. For each capability of that name supported by the provider it will call the callback *cb* and supply a set of **OSSL\_PARAM(3)**s describing the capability. It will also pass back the argument *arg*. For more details about capabilities and what they can be used for please see "CAPABILITIES" in **provider-base(7)**.

## RETURN VALUES

**OSSL\_PROVIDER\_set\_default\_search\_path()**, **OSSL\_PROVIDER\_add()**, **OSSL\_PROVIDER\_unload()**, **OSSL\_PROVIDER\_get\_params()** and **OSSL\_PROVIDER\_get\_capabilities()** return 1 on success, or 0 on error.

**OSSL\_PROVIDER\_load()** and **OSSL\_PROVIDER\_try\_load()** return a pointer to a provider object on success, or NULL on error.

**OSSL\_PROVIDER\_do\_all()** returns 1 if the callback *cb* returns 1 for every provider it is called with, or 0 if any provider callback invocation returns 0; callback processing stops at the first callback invocation on a provider that returns 0.

**OSSL\_PROVIDER\_available()** returns 1 if the named provider is available, otherwise 0.

**OSSL\_PROVIDER\_gettable\_params()** returns a pointer to an array of constant **OSSL\_PARAM(3)**, or NULL if none is provided.

**OSSL\_PROVIDER\_get\_params()** and returns 1 on success, or 0 on error.

**OSSL\_PROVIDER\_query\_operation()** returns an array of **OSSL\_ALGORITHM** or NULL on error.

**OSSL\_PROVIDER\_self\_test()** returns 1 if the self tests pass, or 0 on error.

## EXAMPLES

This demonstrates how to load the provider module "foo" and ask for its build information.

```
#include <openssl/params.h>
#include <openssl/provider.h>
#include <openssl/err.h>

OSSL_PROVIDER *prov = NULL;
const char *build = NULL;
OSSL_PARAM request[] = {
    { "buildinfo", OSSL_PARAM_UTF8_PTR, &build, 0, 0 },
```

```
{ NULL, 0, NULL, 0, 0 }  
};
```

```
if ((prov = OSSL_PROVIDER_load(NULL, "foo")) != NULL  
&& OSSL_PROVIDER_get_params(prov, request))  
    printf("Provider 'foo' buildinfo: %s\n", build);  
else  
    ERR_print_errors_fp(stderr);
```

## SEE ALSO

**openssl-core.h(7)**, **OSSL\_LIB\_CTX(3)**, **provider(7)**

## HISTORY

The type and functions described here were added in OpenSSL 3.0.

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