

NAME

DECLARE_ASN1_FUNCTIONS, IMPLEMENT_ASN1_FUNCTIONS, ASN1_ITEM,
 ACCESS_DESCRIPTION_free, ACCESS_DESCRIPTION_new, ADMISSIONS_free,
 ADMISSIONS_new, ADMISSION_SYNTAX_free, ADMISSION_SYNTAX_new,
 ASIdOrRange_free, ASIdOrRange_new, ASIdentifierChoice_free, ASIdentifierChoice_new,
 ASIdentifiers_free, ASIdentifiers_new, ASRange_free, ASRange_new,
 AUTHORITY_INFO_ACCESS_free, AUTHORITY_INFO_ACCESS_new,
 AUTHORITY_KEYID_free, AUTHORITY_KEYID_new, BASIC_CONSTRAINTS_free,
 BASIC_CONSTRAINTS_new, CERTIFICATEPOLICIES_free, CERTIFICATEPOLICIES_new,
 CMS_ContentInfo_free, CMS_ContentInfo_new, CMS_ContentInfo_new_ex,
 CMS_ContentInfo_print_ctx, CMS_ReceiptRequest_free, CMS_ReceiptRequest_new,
 CRL_DIST_POINTS_free, CRL_DIST_POINTS_new, DIRECTORYSTRING_free,
 DIRECTORYSTRING_new, DISPLAYTEXT_free, DISPLAYTEXT_new,
 DIST_POINT_NAME_free, DIST_POINT_NAME_new, DIST_POINT_free, DIST_POINT_new,
 DSAParams_dup, ECPARAMETERS_free, ECPARAMETERS_new, ECPKPARAMETERS_free,
 ECPKPARAMETERS_new, EDIPARTYNAME_free, EDIPARTYNAME_new, ESS_CERT_ID_dup,
 ESS_CERT_ID_free, ESS_CERT_ID_new, ESS_CERT_ID_V2_dup, ESS_CERT_ID_V2_free,
 ESS_CERT_ID_V2_new, ESS_ISSUER_SERIAL_dup, ESS_ISSUER_SERIAL_free,
 ESS_ISSUER_SERIAL_new, ESS_SIGNING_CERT_dup, ESS_SIGNING_CERT_free,
 ESS_SIGNING_CERT_it, ESS_SIGNING_CERT_new, ESS_SIGNING_CERT_V2_dup,
 ESS_SIGNING_CERT_V2_free, ESS_SIGNING_CERT_V2_it, ESS_SIGNING_CERT_V2_new,
 EXTENDED_KEY_USAGE_free, EXTENDED_KEY_USAGE_new, GENERAL_NAMES_free,
 GENERAL_NAMES_new, GENERAL_NAME_dup, GENERAL_NAME_free,
 GENERAL_NAME_new, GENERAL_SUBTREE_free, GENERAL_SUBTREE_new,
 IPAddressChoice_free, IPAddressChoice_new, IPAddressFamily_free, IPAddressFamily_new,
 IPAddressOrRange_free, IPAddressOrRange_new, IPAddressRange_free, IPAddressRange_new,
 ISSUER_SIGN_TOOL_free, ISSUER_SIGN_TOOL_it, ISSUER_SIGN_TOOL_new,
 ISSUING_DIST_POINT_free, ISSUING_DIST_POINT_it, ISSUING_DIST_POINT_new,
 NAME_CONSTRAINTS_free, NAME_CONSTRAINTS_new, NAMING_AUTHORITY_free,
 NAMING_AUTHORITY_new, NETSCAPE_CERT_SEQUENCE_free,
 NETSCAPE_CERT_SEQUENCE_new, NETSCAPE_SPKAC_free, NETSCAPE_SPKAC_new,
 NETSCAPE_SPKI_free, NETSCAPE_SPKI_new, NOTICEREF_free, NOTICEREF_new,
 OCSP_BASICRESP_free, OCSP_BASICRESP_new, OCSP_CERTID_dup, OCSP_CERTID_new,
 OCSP_CERTSTATUS_free, OCSP_CERTSTATUS_new, OCSP_CRLID_free, OCSP_CRLID_new,
 OCSP_ONEREQ_free, OCSP_ONEREQ_new, OCSP_REQINFO_free, OCSP_REQINFO_new,
 OCSP_RESPBYTES_free, OCSP_RESPBYTES_new, OCSP_RESPDATA_free,
 OCSP_RESPDATA_new, OCSP_RESPID_free, OCSP_RESPID_new, OCSP_RESPONSE_new,
 OCSP_REVOKEDINFO_free, OCSP_REVOKEDINFO_new, OCSP_SERVICELOC_free,
 OCSP_SERVICELOC_new, OCSP_SIGNATURE_free, OCSP_SIGNATURE_new,
 OCSP_SINGLERESP_free, OCSP_SINGLERESP_new, OSSL_CMP_ITAV_dup,

OSSL_CMP_ITAV_free, OSSL_CMP_MSG_dup, OSSL_CMP_MSG_it, OSSL_CMP_MSG_free,
OSSL_CMP_PKIHEADER_free, OSSL_CMP_PKIHEADER_it, OSSL_CMP_PKIHEADER_new,
OSSL_CMP_PKISI_dup, OSSL_CMP_PKISI_free, OSSL_CMP_PKISI_it, OSSL_CMP_PKISI_new,
OSSL_CMP_PKISTATUS_it, OSSL_CRMF_CERTID_dup, OSSL_CRMF_CERTID_free,
OSSL_CRMF_CERTID_it, OSSL_CRMF_CERTID_new, OSSL_CRMF_CERTTEMPLATE_free,
OSSL_CRMF_CERTTEMPLATE_it, OSSL_CRMF_CERTTEMPLATE_new,
OSSL_CRMF_ENCRYPTEDVALUE_free, OSSL_CRMF_ENCRYPTEDVALUE_it,
OSSL_CRMF_ENCRYPTEDVALUE_new, OSSL_CRMF_MSGS_free, OSSL_CRMF_MSGS_it,
OSSL_CRMF_MSGS_new, OSSL_CRMF_MSG_dup, OSSL_CRMF_MSG_free,
OSSL_CRMF_MSG_it, OSSL_CRMF_MSG_new, OSSL_CRMF_PBMPARAMETER_free,
OSSL_CRMF_PBMPARAMETER_it, OSSL_CRMF_PBMPARAMETER_new,
OSSL_CRMF_PKIPUBLICATIONINFO_free, OSSL_CRMF_PKIPUBLICATIONINFO_it,
OSSL_CRMF_PKIPUBLICATIONINFO_new, OSSL_CRMF_SINGLEPUBINFO_free,
OSSL_CRMF_SINGLEPUBINFO_it, OSSL_CRMF_SINGLEPUBINFO_new, OTHERNAME_free,
OTHERNAME_new, PBE2PARAM_free, PBE2PARAM_new, PBEPARAM_free,
PBEPARAM_new, PBKDF2PARAM_free, PBKDF2PARAM_new, PKCS12_BAGS_free,
PKCS12_BAGS_new, PKCS12_MAC_DATA_free, PKCS12_MAC_DATA_new,
PKCS12_SAFE_BAG_free, PKCS12_SAFE_BAG_new, PKCS12_free, PKCS12_new,
PKCS7_DIGEST_free, PKCS7_DIGEST_new, PKCS7_ENCRYPT_free, PKCS7_ENCRYPT_new,
PKCS7_ENC_CONTENT_free, PKCS7_ENC_CONTENT_new, PKCS7_ENVELOPE_free,
PKCS7_ENVELOPE_new, PKCS7_ISSUER_AND_SERIAL_free,
PKCS7_ISSUER_AND_SERIAL_new, PKCS7_RECIP_INFO_free, PKCS7_RECIP_INFO_new,
PKCS7_SIGNED_free, PKCS7_SIGNED_new, PKCS7_SIGNER_INFO_free,
PKCS7_SIGNER_INFO_new, PKCS7_SIGN_ENVELOPE_free, PKCS7_SIGN_ENVELOPE_new,
PKCS7_dup, PKCS7_free, PKCS7_new_ex, PKCS7_new, PKCS7_print_ctx,
PKCS8_PRIV_KEY_INFO_free, PKCS8_PRIV_KEY_INFO_new, PKEY_USAGE_PERIOD_free,
PKEY_USAGE_PERIOD_new, POLICYINFO_free, POLICYINFO_new, POLICYQUALINFO_free,
POLICYQUALINFO_new, POLICY_CONSTRAINTS_free, POLICY_CONSTRAINTS_new,
POLICY_MAPPING_free, POLICY_MAPPING_new, PROFESSION_INFOS_free,
PROFESSION_INFOS_new, PROFESSION_INFO_free, PROFESSION_INFO_new,
PROXY_CERT_INFO_EXTENSION_free, PROXY_CERT_INFO_EXTENSION_new,
PROXY_POLICY_free, PROXY_POLICY_new, RSA_PrivateKey_dup, RSA_PublicKey_dup,
RSA_OAEP_PARAMS_free, RSA_OAEP_PARAMS_new, RSA_PSS_PARAMS_free,
RSA_PSS_PARAMS_new, RSA_PSS_PARAMS_dup, SCRYPT_PARAMS_free,
SCRYPT_PARAMS_new, SXNETID_free, SXNETID_new, SXNET_free, SXNET_new,
TLS_FEATURE_free, TLS_FEATURE_new, TS_ACCURACY_dup, TS_ACCURACY_free,
TS_ACCURACY_new, TS_MSG_IMPRINT_dup, TS_MSG_IMPRINT_free,
TS_MSG_IMPRINT_new, TS_REQ_dup, TS_REQ_free, TS_REQ_new, TS_RESP_dup,
TS_RESP_free, TS_RESP_new, TS_STATUS_INFO_dup, TS_STATUS_INFO_free,
TS_STATUS_INFO_new, TS_TST_INFO_dup, TS_TST_INFO_free, TS_TST_INFO_new,

USERNOTICE_free, USERNOTICE_new, X509_ALGOR_free, X509_ALGOR_it,
 X509_ALGOR_new, X509_ATTRIBUTE_dup, X509_ATTRIBUTE_free, X509_ATTRIBUTE_new,
 X509_CERT_AUX_free, X509_CERT_AUX_new, X509_CINF_free, X509_CINF_new,
 X509_CRL_INFO_free, X509_CRL_INFO_new, X509_CRL_dup, X509_CRL_free,
 X509_CRL_new_ex, X509_CRL_new, X509_EXTENSION_dup, X509_EXTENSION_free,
 X509_EXTENSION_new, X509_NAME_ENTRY_dup, X509_NAME_ENTRY_free,
 X509_NAME_ENTRY_new, X509_NAME_dup, X509_NAME_free, X509_NAME_new,
 X509_REQ_INFO_free, X509_REQ_INFO_new, X509_REQ_dup, X509_REQ_free,
 X509_REQ_new, X509_REQ_new_ex, X509_REVOKED_dup, X509_REVOKED_free,
 X509_REVOKED_new, X509_SIG_free, X509_SIG_new, X509_VAL_free, X509_VAL_new,
 X509_dup, - ASN1 object utilities

SYNOPSIS

```
#include <openssl/asn1t.h>
```

```
DECLARE_ASN1_FUNCTIONS(type)
IMPLEMENT_ASN1_FUNCTIONS(stname)
```

```
typedef struct ASN1_ITEM_st ASN1_ITEM;
```

```
extern const ASN1_ITEM TYPE_it;
TYPE *TYPE_new(void);
TYPE *TYPE_dup(const TYPE *a);
void TYPE_free(TYPE *a);
int TYPE_print_ctx(BIO *out, TYPE *a, int indent, const ASN1_PCTX *pctx);
```

The following functions have been deprecated since OpenSSL 3.0, and can be hidden entirely by defining **OPENSSL_API_COMPAT** with a suitable version value, see **openssl_user_macros(7)**:

```
DSA *DSAParams_dup(const DSA *dsa);
RSA *RSAPrivateKey_dup(const RSA *rsa);
RSA *RSAPublicKey_dup(const RSA *rsa);
```

DESCRIPTION

In the description below, **TYPE** is used as a placeholder for any of the OpenSSL datatypes, such as **X509**.

The OpenSSL ASN1 parsing library templates are like a data-driven bytecode interpreter. Every ASN1 object as a global variable, **TYPE_it**, that describes the item such as its fields. (On systems which cannot export variables from shared libraries, the global is instead a function which returns a pointer to

a static variable.

The macro **DECLARE_ASN1_FUNCTIONS()** is typically used in header files to generate the function declarations.

The macro **IMPLEMENT_ASN1_FUNCTIONS()** is used once in a source file to generate the function bodies.

TYPE_new() allocates an empty object of the indicated type. The object returned must be released by calling **TYPE_free()**.

TYPE_new_ex() is similar to **TYPE_new()** but also passes the library context *libctx* and the property query *propq* to use when retrieving algorithms from providers. This created object can then be used when loading binary data using **d2i_TYPE()**.

TYPE_dup() copies an existing object, leaving it untouched.

TYPE_free() releases the object and all pointers and sub-objects within it.

TYPE_print_ctx() prints the object *a* on the specified BIO *out*. Each line will be prefixed with *indent* spaces. The *pctx* specifies the printing context and is for internal use; use NULL to get the default behavior. If a print function is user-defined, then pass in any *pctx* down to any nested calls.

RETURN VALUES

TYPE_new(), **TYPE_new_ex()** and **TYPE_dup()** return a pointer to the object or NULL on failure.

TYPE_print_ctx() returns 1 on success or zero on failure.

HISTORY

The functions **X509_REQ_new_ex()**, **X509_CRL_new_ex()**, **PKCS7_new_ex()** and **CMS_ContentInfo_new_ex()** were added in OpenSSL 3.0.

The functions **DSAParams_dup()**, **RSAPrivateKey_dup()** and **RSAPublicKey_dup()** were deprecated in 3.0.

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