

:mod:`crypt` --- Function to check Unix passwords

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 1); [backlink](#)

Unknown interpreted text role "mod".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 4)

Unknown directive type "module".

```
.. module:: crypt
   :platform: Unix
   :synopsis: The crypt() function used to check Unix passwords.
   :deprecated:
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 9)

Unknown directive type "moduleauthor".

```
.. moduleauthor:: Steven D. Majewski <sdm7g@virginia.edu>
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 10)

Unknown directive type "sectionauthor".

```
.. sectionauthor:: Steven D. Majewski <sdm7g@virginia.edu>
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 11)

Unknown directive type "sectionauthor".

```
.. sectionauthor:: Peter Funk <pf@artcom-gmbh.de>
```

Source code: :source:`Lib/crypt.py`

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Unknown interpreted text role "source".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 15)

Unknown directive type "index".

```
.. index::
   single: crypt(3)
   pair: cipher; DES
```

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Unknown directive type "deprecated".

```
.. deprecated:: 3.11
   The :mod:`crypt` module is deprecated (see :pep:`594` for details).
```

This module implements an interface to the `manpage: crypt(3)` routine, which is a one-way hash function based upon a modified DES algorithm; see the Unix man page for further details. Possible uses include storing hashed passwords so you can check passwords without storing the actual password, or attempting to crack Unix passwords with a dictionary.

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Unknown interpreted text role "manpage".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\ (cpython-main) (Doc) (library) crypt.rst, line 30)

Unknown directive type "index".

```
.. index:: single: crypt(3)
```

Notice that the behavior of this module depends on the actual implementation of the `manpage: crypt(3)` routine in the running system. Therefore, any extensions available on the current implementation will also be available on this module.

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Unknown interpreted text role "manpage".

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Unknown directive type "availability".

```
.. availability:: Unix. Not available on VxWorks.
```

Hashing Methods

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Unknown directive type "versionadded".

```
.. versionadded:: 3.3
```

The `mod: crypt` module defines the list of hashing methods (not all methods are available on all platforms):

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Unknown interpreted text role "mod".

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Unknown directive type "data".

```
.. data:: METHOD_SHA512
```

```
A Modular Crypt Format method with 16 character salt and 86 character
hash based on the SHA-512 hash function. This is the strongest method.
```

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Unknown directive type "data".

```
.. data:: METHOD_SHA256
```

```
Another Modular Crypt Format method with 16 character salt and 43
character hash based on the SHA-256 hash function.
```

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Unknown directive type "data".

```
.. data:: METHOD_BLOWFISH
```

Another Modular Crypt Format method with 22 character salt and 31 character hash based on the Blowfish cipher.

```
.. versionadded:: 3.7
```

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Unknown directive type "data".

```
.. data:: METHOD_MD5
```

Another Modular Crypt Format method with 8 character salt and 22 character hash based on the MD5 hash function.

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Unknown directive type "data".

```
.. data:: METHOD_CRYPT
```

The traditional method with a 2 character salt and 13 characters of hash. This is the weakest method.

Module Attributes

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Unknown directive type "versionadded".

```
.. versionadded:: 3.3
```

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Unknown directive type "attribute".

```
.. attribute:: methods
```

A list of available password hashing algorithms, as ``crypt.METHOD_*`` objects. This list is sorted from strongest to weakest.

Module Functions

The `crypt` module defines the following functions:

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Unknown interpreted text role "mod".

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Unknown directive type "function".

```
.. function:: crypt(word, salt=None)
```

word will usually be a user's password as typed at a prompt or in a graphical interface. The optional **salt** is either a string as returned from `:func:`mksalt``, one of the ```crypt.METHOD_*``` values (though not all may be available on all platforms), or a full encrypted password including salt, as returned by this function. If **salt** is not provided, the strongest method available in `:attr:`methods`` will be used.

Checking a password is usually done by passing the plain-text password as **word** and the full results of a previous `:func:`crypt`` call, which should be the same as the results of this call.

salt (either a random 2 or 16 character string, possibly prefixed with ```$digit$``` to indicate the method) which will be used to perturb the encryption algorithm. The characters in **salt** must be in the set ```[./a-zA-Z0-9]```, with the exception of Modular Crypt Format which prefixes a ```$digit$```.

Returns the hashed password as a string, which will be composed of characters from the same alphabet as the salt.

```
.. index:: single: crypt(3)
```

Since a few `:manpage:`crypt(3)`` extensions allow different values, with different sizes in the **salt**, it is recommended to use the full crypted password as salt when checking for a password.

```
.. versionchanged:: 3.3
    Accept ``crypt.METHOD_*`` values in addition to strings for *salt*.
```

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Unknown directive type "function".

```
.. function:: mksalt(method=None, *, rounds=None)
```

Return a randomly generated salt of the specified method. If no **method** is given, the strongest method available in `:attr:`methods`` is used.

The return value is a string suitable for passing as the **salt** argument to `:func:`crypt``.

rounds specifies the number of rounds for ```METHOD_SHA256```, ```METHOD_SHA512``` and ```METHOD_BLOWFISH```. For ```METHOD_SHA256``` and ```METHOD_SHA512``` it must be an integer between ```1000``` and ```999_999_999```, the default is ```5000```. For ```METHOD_BLOWFISH``` it must be a power of two between ```16``` (2\ :sup:`4`) and ```2_147_483_648``` (2\ :sup:`31`), the default is ```4096``` (2\ :sup:`12`).

```
.. versionadded:: 3.3
```

```
.. versionchanged:: 3.7
    Added the *rounds* parameter.
```

Examples

A simple example illustrating typical use (a constant-time comparison operation is needed to limit exposure to timing attacks. `:func:`hmac.compare_digest`` is suitable for this purpose):

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Unknown interpreted text role "func".

```
import pwd
import crypt
import getpass
```

```
from hmac import compare_digest as compare_hash

def login():
    username = input('Python login: ')
    cryptedpasswd = pwd.getpwnam(username)[1]
    if cryptedpasswd:
        if cryptedpasswd == 'x' or cryptedpasswd == '*':
            raise ValueError('no support for shadow passwords')
        cleartext = getpass.getpass()
        return compare_hash(crypt.crypt(cleartext, cryptedpasswd), cryptedpasswd)
    else:
        return True
```

To generate a hash of a password using the strongest available method and check it against the original:

```
import crypt
from hmac import compare_digest as compare_hash

hashed = crypt.crypt(plaintext)
if not compare_hash(hashed, crypt.crypt(plaintext, hashed)):
    raise ValueError("hashed version doesn't validate against original")
```