:mod:`uuid` --- UUID objects according to RFC 4122

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

Unknown directive type "module".

```
.. module:: uuid
   :synopsis: UUID objects (universally unique identifiers) according to RFC 4122
```

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 6)

Unknown directive type "moduleauthor".

```
.. moduleauthor:: Ka-Ping Yee <ping@zesty.ca>
```

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 7)

Unknown directive type "sectionauthor".

```
.. sectionauthor:: George Yoshida <quiver@users.sourceforge.net>
```

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

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 9); *backlink*

Unknown interpreted text role "source".

This module provides immutable :class:`UUID` objects (the :class:`UUID` class) and the functions :func:`uuid1`, :func:`uuid3`, :func:`uuid4`, :func:`uuid5` for generating version 1, 3, 4, and 5 UUIDs as specified in RFC 4122.

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 13); *backlink*

Unknown interpreted text role "class".

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 13); *backlink*

Unknown interpreted text role "class".

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 13); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 13); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 13); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 13); *backlink*

Unknown interpreted text role "func".

If all you want is a unique ID, you should probably call :func:`uuid1` or :func:`uuid4`. Note that :func:`uuid1` may compromise privacy since it creates a UUID containing the computer's network address. :func:`uuid4` creates a random UUID.

System Message: ERROR/3 (`D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst`, line 17); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 17); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 17); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 17); *backlink*

Unknown interpreted text role "func".

Depending on support from the underlying platform, :func:`uuid1` may or may not return a "safe" UUID. A safe UUID is one which is generated using synchronization methods that ensure no two processes can obtain the same UUID. All instances of :class:`UUID` have an :attr:`is_safe` attribute which relays any information about the UUID's safety, using this enumeration:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 22); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 22); *backlink*

Unknown interpreted text role "class".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 22); *backlink*

Unknown interpreted text role "attr".

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

Unknown directive type "versionadded".

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

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 32)

Unknown directive type "attribute".

```
.. attribute:: SafeUUID.safe

   The UUID was generated by the platform in a multiprocessing-safe way.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 36)

Unknown directive type "attribute".

```
.. attribute:: SafeUUID.unsafe

   The UUID was not generated in a multiprocessing-safe way.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 40)

Unknown directive type "attribute".

```
.. attribute:: SafeUUID.unknown

   The platform does not provide information on whether the UUID was
   generated safely or not.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 45)

Invalid class attribute value for "class" directive: "UUID(hex=None, bytes=None, bytes_le=None, fields=None, int=None, version=None, *, is_safe=SafeUUID.unknown)".

```
.. class:: UUID(hex=None, bytes=None, bytes_le=None, fields=None, int=None, version=None, *, is_safe=SafeUU
```

```
Create a UUID from either a string of 32 hexadecimal digits, a string of 16
bytes in big-endian order as the *bytes* argument, a string of 16 bytes in
little-endian order as the *bytes_le* argument, a tuple of six integers
(32-bit *time_low*, 16-bit *time_mid*, 16-bit *time_hi_version*,
8-bit *clock_seq_hi_variant*, 8-bit *clock_seq_low*, 48-bit *node*) as the
*fields* argument, or a single 128-bit integer as the *int* argument.
When a string of hex digits is given, curly braces, hyphens,
and a URN prefix are all optional.  For example, these
expressions all yield the same UUID::

   UUID('{12345678-1234-5678-1234-567812345678}')
   UUID('12345678123456781234567812345678')
   UUID('urn:uuid:12345678-1234-5678-1234-567812345678')
   UUID(bytes=b'\x12\x34\x56\x78'*4)
   UUID(bytes_le=b'\x78\x56\x34\x12\x34\x12\x78\x56' +
                 b'\x12\x34\x56\x78\x12\x34\x56\x78')
   UUID(fields=(0x12345678, 0x1234, 0x5678, 0x12, 0x34, 0x567812345678))
   UUID(int=0x12345678123456781234567812345678)

Exactly one of *hex*, *bytes*, *bytes_le*, *fields*, or *int* must be given.
The *version* argument is optional; if given, the resulting UUID will have its
variant and version number set according to :rfc:`4122`, overriding bits in the
given *hex*, *bytes*, *bytes_le*, *fields*, or *int*.

Comparison of UUID objects are made by way of comparing their
:attr:`UUID.int` attributes.  Comparison with a non-UUID object
raises a :exc:`TypeError`.

``str(uuid)`` returns a string in the form
``12345678-1234-5678-1234-567812345678`` where the 32 hexadecimal digits
represent the UUID.
```

:class:`UUID` instances have these read-only attributes:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 79); *backlink*

Unknown interpreted text role "class".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 81)

Unknown directive type "attribute".

```
.. attribute:: UUID.bytes

   The UUID as a 16-byte string (containing the six integer fields in big-endian
   byte order).
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 87)

Unknown directive type "attribute".

```
.. attribute:: UUID.bytes_le

   The UUID as a 16-byte string (with *time_low*, *time_mid*, and *time_hi_version*
   in little-endian byte order).
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 93)

Unknown directive type "attribute".

```
.. attribute:: UUID.fields

   A tuple of the six integer fields of the UUID, which are also available as six
   individual attributes and two derived attributes:

   +------------------------------+------------------------------+
   | Field                        | Meaning                      |
   +==============================+==============================+
   | :attr:`time_low`             | the first 32 bits of the UUID |
   +------------------------------+------------------------------+
   | :attr:`time_mid`             | the next 16 bits of the UUID  |
   +------------------------------+------------------------------+
   | :attr:`time_hi_version`      | the next 16 bits of the UUID  |
   +------------------------------+------------------------------+
   | :attr:`clock_seq_hi_variant` | the next 8 bits of the UUID   |
   +------------------------------+------------------------------+
   | :attr:`clock_seq_low`        | the next 8 bits of the UUID   |
   +------------------------------+------------------------------+
   | :attr:`node`                 | the last 48 bits of the UUID  |
   +------------------------------+------------------------------+
   | :attr:`time`                 | the 60-bit timestamp          |
   +------------------------------+------------------------------+
```

```
| :attr:`clock_seq`             | the 14-bit sequence number    |
+-------------------------------+-------------------------------+
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 119)

Unknown directive type "attribute".

```
.. attribute:: UUID.hex

   The UUID as a 32-character lowercase hexadecimal string.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 124)

Unknown directive type "attribute".

```
.. attribute:: UUID.int

   The UUID as a 128-bit integer.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 129)

Unknown directive type "attribute".

```
.. attribute:: UUID.urn

   The UUID as a URN as specified in :rfc:`4122`.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 134)

Unknown directive type "attribute".

```
.. attribute:: UUID.variant

   The UUID variant, which determines the internal layout of the UUID. This will be
   one of the constants :const:`RESERVED_NCS`, :const:`RFC_4122`,
   :const:`RESERVED_MICROSOFT`, or :const:`RESERVED_FUTURE`.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 141)

Unknown directive type "attribute".

```
.. attribute:: UUID.version

   The UUID version number (1 through 5, meaningful only when the variant is
   :const:`RFC_4122`).
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 146)

Unknown directive type "attribute".

```
.. attribute:: UUID.is_safe

   An enumeration of :class:`SafeUUID` which indicates whether the platform
   generated the UUID in a multiprocessing-safe way.

   .. versionadded:: 3.7
```

The :mod:`uuid` module defines the following functions:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 153); *backlink*

Unknown interpreted text role "mod".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 156)

Unknown directive type "function".

```
.. function:: getnode()
```

```
Get the hardware address as a 48-bit positive integer.  The first time this
runs, it may launch a separate program, which could be quite slow.  If all
attempts to obtain the hardware address fail, we choose a random 48-bit
number with the multicast bit (least significant bit of the first octet)
set to 1 as recommended in :rfc:`4122`.  "Hardware address" means the MAC
address of a network interface.  On a machine with multiple network
interfaces, universally administered MAC addresses (i.e. where the second
least significant bit of the first octet is *unset*) will be preferred over
locally administered MAC addresses, but with no other ordering guarantees.

.. versionchanged:: 3.7
   Universally administered MAC addresses are preferred over locally
   administered MAC addresses, since the former are guaranteed to be
   globally unique, while the latter are not.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 173)

Unknown directive type "index".

```
.. index:: single: getnode
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 176)

Unknown directive type "function".

```
.. function:: uuid1(node=None, clock_seq=None)

   Generate a UUID from a host ID, sequence number, and the current time. If *node*
   is not given, :func:`getnode` is used to obtain the hardware address. If
   *clock_seq* is given, it is used as the sequence number; otherwise a random
   14-bit sequence number is chosen.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 183)

Unknown directive type "index".

```
.. index:: single: uuid1
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 186)

Unknown directive type "function".

```
.. function:: uuid3(namespace, name)

   Generate a UUID based on the MD5 hash of a namespace identifier (which is a
   UUID) and a name (which is a string).
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 191)

Unknown directive type "index".

```
.. index:: single: uuid3
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 194)

Unknown directive type "function".

```
.. function:: uuid4()

   Generate a random UUID.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 198)

Unknown directive type "index".

```
.. index:: single: uuid4
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 201)

Unknown directive type "function".

```
.. function:: uuid5(namespace, name)

   Generate a UUID based on the SHA-1 hash of a namespace identifier (which is a
   UUID) and a name (which is a string).
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 206)

Unknown directive type "index".

```
.. index:: single: uuid5
```

The :mod:`uuid` module defines the following namespace identifiers for use with :func:`uuid3` or :func:`uuid5`.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 208); *backlink*

Unknown interpreted text role "mod".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 208); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 208); *backlink*

Unknown interpreted text role "func".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 212)

Unknown directive type "data".

```
.. data:: NAMESPACE_DNS

   When this namespace is specified, the *name* string is a fully-qualified domain
   name.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 218)

Unknown directive type "data".

```
.. data:: NAMESPACE_URL

   When this namespace is specified, the *name* string is a URL.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 223)

Unknown directive type "data".

```
.. data:: NAMESPACE_OID

   When this namespace is specified, the *name* string is an ISO OID.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 228)

Unknown directive type "data".

```
.. data:: NAMESPACE_X500

   When this namespace is specified, the *name* string is an X.500 DN in DER or a
   text output format.
```

The :mod:`uuid` module defines the following constants for the possible values of the :attr:`variant` attribute:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 233); *backlink*

Unknown interpreted text role "mod".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 233); *backlink*

Unknown interpreted text role "attr".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 237)

Unknown directive type "data".

```
.. data:: RESERVED_NCS

   Reserved for NCS compatibility.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 242)

Unknown directive type "data".

```
.. data:: RFC_4122

   Specifies the UUID layout given in :rfc:`4122`.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 247)

Unknown directive type "data".

```
.. data:: RESERVED_MICROSOFT

   Reserved for Microsoft compatibility.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 252)

Unknown directive type "data".

```
.. data:: RESERVED_FUTURE

   Reserved for future definition.
```

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 257)

Unknown directive type "seealso".

```
.. seealso::

   :rfc:`4122` - A Universally Unique IDentifier (UUID) URN Namespace
      This specification defines a Uniform Resource Name namespace for UUIDs, the
      internal format of UUIDs, and methods of generating UUIDs.
```

Example

Here are some examples of typical usage of the :mod:`uuid` module:

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Doc\library\[cpython-main][Doc][library]uuid.rst, line 269); *backlink*

Unknown interpreted text role "mod".

```
>>> import uuid

>>> # make a UUID based on the host ID and current time
>>> uuid.uuid1()
UUID('a8098c1a-f86e-11da-bd1a-00112444be1e')

>>> # make a UUID using an MD5 hash of a namespace UUID and a name
>>> uuid.uuid3(uuid.NAMESPACE_DNS, 'python.org')
UUID('6fa459ea-ee8a-3ca4-894e-db77e160355e')

>>> # make a random UUID
>>> uuid.uuid4()
UUID('16fd2706-8baf-433b-82eb-8c7fada847da')

>>> # make a UUID using a SHA-1 hash of a namespace UUID and a name
>>> uuid.uuid5(uuid.NAMESPACE_DNS, 'python.org')
UUID('886313e1-3b8a-5372-9b90-0c9aee199e5d')
```

```
>>> # make a UUID from a string of hex digits (braces and hyphens ignored)
>>> x = uuid.UUID('{00010203-0405-0607-0809-0a0b0c0d0e0f}')

>>> # convert a UUID to a string of hex digits in standard form
>>> str(x)
'00010203-0405-0607-0809-0a0b0c0d0e0f'

>>> # get the raw 16 bytes of the UUID
>>> x.bytes
b'\x00\x01\x02\x03\x04\x05\x06\x07\x08\t\n\x0b\x0c\r\x0e\x0f'

>>> # make a UUID from a 16-byte string
>>> uuid.UUID(bytes=x.bytes)
UUID('00010203-0405-0607-0809-0a0b0c0d0e0f')
```