

Fix web cache poisoning vulnerability by defaulting the query args separator to `&`, and allowing the user to choose a custom separator.

Fix `SystemError` raised when `PyArg_Parse*()` is used with `#` but without `PY_SSIZE_T_CLEAN` defined.

`PyArg_Parse*()` functions now emits `DeprecationWarning` when `u` or `z` format is used. See [PEP 623](#) for detail.

Add a new `:c:func:'PySet_CheckExact'` function to the C-API to check if an object is an instance of `:class:'set'` but not an instance of a subtype. Patch by Pablo Galindo.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 37); [backlink](#)

Unknown interpreted text role "c:func".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 37); [backlink](#)

Unknown interpreted text role "class".

The `:data:'types.FunctionType'` constructor now inherits the current builtins if the `globals` dictionary has no `"__builtins__"` key, rather than using `{ "None": None }` as builtins: same behavior as `:func:'eval'` and `:func:'exec'` functions. Defining a function with `def function(...): ...` in Python is not affected, `globals` cannot be overridden with this syntax: it also inherits the current builtins. Patch by Victor Stinner.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 48); [backlink](#)

Unknown interpreted text role "data".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 48); [backlink](#)

Unknown interpreted text role "func".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 48); [backlink](#)

Unknown interpreted text role "func".

Functions have a new `__builtins__` attribute which is used to look for builtin symbols when a function is executed, instead of looking into `__globals__['__builtins__']`. Patch by Mark Shannon and Victor Stinner.

Improve the error message in the parser for exception groups without parentheses. Patch by Pablo Galindo.

Fixed an incorrect `:exc:'SyntaxError'` message for missing comma in literals. Patch by Pablo Galindo.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 83); [backlink](#)

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`:mod:'readline'`: Explicitly disable bracketed paste in the interactive interpreter, even if it's set in the inputrc, is enabled by default (eg GNU Readline 8.1), or a user calls `readline.read_init_file()`. The Python REPL has not implemented bracketed paste support. Also, bracketed mode writes the `"\x1b[?2004h"` escape sequence into stdout which causes test failures in applications that don't support it. It can still be explicitly enabled by calling `readline.parse_and_bind("set enable-bracketed-paste on")`. Patch by Dustin Rodrigues.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 93); [backlink](#)

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Simple calls to `type(object)` are now faster due to the `vectorcall` calling convention. Patch by Dennis Sweeney.

Make the compiler merges same `co_code` and `co_linetable` objects in a module like already did for `co_consts`.

Substring search functions such as `str1 in str2` and `str2.find(str1)` now sometimes use the "Two-Way" string comparison algorithm to avoid quadratic behavior on long strings.

Implement [PEP 634](#) (structural pattern matching). Patch by Brandt Bucher.

In the `:func:`concurrent.futures.ProcessPoolExecutor``, validate that `:func:`multiprocess.synchronize`` is available on a given platform and rely on that check in the `:mod:`concurrent.futures`` test suite so we can run tests that are unrelated to `:class:`ProcessPoolExecutor`` on those platforms.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 149); [backlink](#)

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**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 149); [backlink](#)

Unknown interpreted text role "func".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 149); [backlink](#)

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**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 149); [backlink](#)

Unknown interpreted text role "class".

If `:func:`object.__ipow__`` returns `:const:`NotImplemented``, the operator will correctly fall back to `:func:`object.__pow__`` and `:func:`object.__rpow__`` as expected.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 161); [backlink](#)

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**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 161); [backlink](#)

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**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 161); [backlink](#)

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**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 161); [backlink](#)

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The `python -m gzip` command line application now properly fails when detecting an unsupported extension. It exits with a non-zero exit code and prints an error message to `stderr`.

Set the chunk size for the `gzip` module main function to `io.DEFAULT_BUFFER_SIZE`. This is slightly faster than the 1024 bytes constant that was used previously.

Handle `None` in single-arg versions of `:func:`~traceback.print_exception`` and `:func:`~traceback.format_exception``.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 194); [backlink](#)

Unknown interpreted text role "func".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 194); [backlink](#)

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Fix TextIOWrapper can not flush internal buffer forever after very large text is written.

Prevent needless allocation of `:mod:'sqlite3'` aggregate function context when no rows match an aggregate query. Patch by Erlend E. Aasland.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 214); [backlink](#)

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Improve `:mod:'sqlite3'` error handling: `sqlite3_column_name()` failures now result in `:exc:'MemoryError'`. Patch by Erlend E. Aasland.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 224); [backlink](#)

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**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 224); [backlink](#)

Unknown interpreted text role "exc".

Fix segfault in `:meth:'sqlite3.Connection.backup'` if no argument was provided. The regression was introduced by GH-23838. Patch by Erlend E. Aasland.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 234); [backlink](#)

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The readline module now passes its tests when built directly against libedit. Existing irreconcilable API differences remain in `:func:'readline.get_begidx'` and `:func:'readline.get_endidx'` behavior based on libreadline vs libedit use.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 245); [backlink](#)

Unknown interpreted text role "func".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 245); [backlink](#)

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Fix a bug in `:mod:'codeop'` that was causing it to not ask for more input when multi-line snippets have unclosed parentheses. Patch by Pablo Galindo

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 257); [backlink](#)

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deprecate unsupported ability to access enum members as attributes of other enum members

Fix recent regression in None argument handling in `:mod:'~traceback'` module functions.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 277); [backlink](#)

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The namedtuple `__new__` method had its `__builtins__` set to None instead of an actual dictionary. This created problems for introspection tools.

Added `:data:'~os.O_EVTONLY'`, `:data:'~os.O_FSYNC'`, `:data:'~os.O_SYMLINK'` and `:data:'~os.O_NOFOLLOW_ANY'` for macOS. Patch by Dong-hee Na.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 297); [backlink](#)**

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**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 297); [backlink](#)**

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**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 297); [backlink](#)**

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**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 297); [backlink](#)**

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Adds `:data:`resource.RLIMIT_KQUEUES`` constant from FreeBSD to the `:mod:`resource`` module.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 307); [backlink](#)**

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**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 307); [backlink](#)**

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Make the pure Python implementation of `:mod:`xml.etree.ElementTree`` behave the same as the C implementation (`:mod:`_elementtree``) regarding default attribute values (by not setting `specified_attributes=1`).

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 317); [backlink](#)**

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**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 317); [backlink](#)**

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In ctypes, now packed bitfields are calculated properly and the first item of packed bitfields is now shrank correctly.

Clarify that 'yield from <expr>' works with any iterable, not just iterators.

Update some deprecated unicode APIs which are documented as "will be removed in 4.0" to "3.12". See [PEP 623](#) for detail.

Fix test\_importlib to correctly skip Unicode file tests if the filesystem does not support them.

Windows build now uses `/utf-8` compiler option.

Add a new configure `--without-static-libpython` option to not build the `libpythonMAJOR.MINOR` a static library and not install the `python.o` object file.

The configure script can now use `libedit` instead of `readline` with the command line option `--with-readline=editline`.

Make configure script use `pkg-config` to detect the location of Tcl/Tk headers and libraries, used to build tkinter.

On macOS, a Tcl/Tk configuration provided by `pkg-config` will be preferred over Tcl/Tk frameworks installed in `{System/,}Library/Frameworks`. If both exist and the latter is preferred, the appropriate `--with-tcltk=*` configuration options need to be explicitly set.

Add the "regen-frozen" makefile target that regenerates the code for the frozen `__hello__` module.

`:c:func:`PyCMethod_New`` is now present in `python3.lib`.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 423); [backlink](#)**

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Update macOS installer build to use OpenSSL 1.1.1j.

Document why printing to IDLE's Shell is often slower than printing to a system terminal and that it can be made faster by pre-formatting a single string before printing.

Always put compiler and system information on the first line of the REPL welcome message.

Remove the private `_PyErr_OCCURRED()` macro: use the public `c:func:'PyErr_Occurred'` function instead.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 462); [backlink](#)**

Unknown interpreted text role "c:func".

Move `odictobject.h`, `parser_interface.h`, `picklebufobject.h`, `pydebug.h`, and `pyfp.h` into the `cpython/` directory. They must not be included directly, as they are already included by `Python.h`: `ref:'Include Files <api-includes>'`.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 472); [backlink](#)**

Unknown interpreted text role "ref".

Move `pyarena.h`, `pyctype.h`, and `pytime.h` into the `cpython/` directory. They must not be included directly, as they are already included by `Python.h`: `ref:'Include Files <api-includes>'`.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 483); [backlink](#)**

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`c:func:'PyExceptionClass_Name'` is now always declared as a function, in order to hide implementation details. The macro accessed `c:member:'PyTypeObject.tp_name'` directly. Patch by Erlend E. Aasland.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 494); [backlink](#)**

Unknown interpreted text role "c:func".

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 494); [backlink](#)**

Unknown interpreted text role "c:member".

The `c:func:'PyCFunction_New'` function is now exported in the ABI when compiled with `-fvisibility=hidden`.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 505); [backlink](#)**

Unknown interpreted text role "c:func".

`c:func:'PyIter_Check'` is now always declared as a function, in order to hide implementation details. The macro accessed `c:member:'PyTypeObject.tp_iternext'` directly. Patch by Erlend E. Aasland.

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 515); [backlink](#)**

Unknown interpreted text role "c:func".

**System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 515); [backlink](#)**

Unknown interpreted text role "c:member".

Convert `:c:func:'PyDescr_IsData'` macro to a function to hide implementation details: The macro accessed `:c:member:'PyTypeObject.tp_descr_set'` directly. Patch by Erlend E. Aasland.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 526); [backlink](#)

Unknown interpreted text role "c:func".

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 526); [backlink](#)

Unknown interpreted text role "c:member".

Convert `:c:func:'PyObject_TypeCheck'` macro to a static inline function. Patch by Erlend E. Aasland.

**System Message: ERROR/3** (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a6.rst, line 537); [backlink](#)

Unknown interpreted text role "c:func".