

CVE-2021-3426: Remove the `getfile` feature of the `:mod:'pydoc'` module which could be abused to read arbitrary files on the disk (directory traversal vulnerability). Moreover, even source code of Python modules can contain sensitive data like passwords. Vulnerability reported by David SchwÃ¶rger.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 7); [backlink](#)

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`:mod:'ftplib'` no longer trusts the IP address value returned from the server in response to the PASV command by default. This prevents a malicious FTP server from using the response to probe IPv4 address and port combinations on the client network.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 20); [backlink](#)

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Code that requires the former vulnerable behavior may set a `trust_server_pasv_ipv4_address` attribute on their `:class:'ftplib.FTP'` instances to `True` to re-enable it.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 25); [backlink](#)

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Add audit hooks for `:func:'gc.get_objects'`, `:func:'gc.get_referrers'` and `:func:'gc.get_referents'`. Patch by Pablo Galindo.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 36); [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] 3.10.0a7.rst, line 36); [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] 3.10.0a7.rst, line 36); [backlink](#)

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Update CPython bytecode magic number.

Raise `ImportWarning` when calling `find_loader()`.

Fix crash that happens when replacing `sys.stderr` with a callable that can remove the object while an exception is being printed. Patch by Pablo Galindo.

The bytecode interpreter uses instruction, rather byte, offsets internally. This reduces the number of `EXTENDED_ARG` instructions needed and streamlines instruction dispatch a bit.

Fix reference leak in the `:mod:'_hashopenssl'` extension. Patch by Pablo Galindo.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 86); [backlink](#)

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Calls to `find_module()` by the import system now raise `ImportWarning`.

Improve the syntax error for invalid usage of double starred elements (`**`) in f-strings. Patch by Pablo Galindo.

Speed up calls to `map()` by using the [PEP 590](#) `vectorcall` calling convention. Patch by Dong-hee Na.

The import system now prefers using `__spec__` for `ModuleType`. `__repr__` over `module_repr()`.

Added micro-optimizations to `_PyType_Lookup()` to improve cache lookup performance in the common case of cache hits.

Report the column offset for `:exc:'SyntaxError'` for invalid line continuation characters. Patch by Pablo Galindo.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 145); [backlink](#)

Unknown interpreted text role "exc".

Fix misdetection of circular imports when using `from pkg.mod import attr`, which caused false positives in non-trivial multi-threaded code.

Emit SyntaxWarnings for assertions with tuple constants, this is a regression introduced in python3.7

Tracing now has correct line numbers for attribute accesses when the attribute is on a different line from the object. Improves debugging and profiling for multi-line method chains.

Python no longer fails at startup with a fatal error if a command line argument contains an invalid Unicode character. The `c:func:Py_DecodeLocale` function now escapes byte sequences which would be decoded as Unicode characters outside the [U+0000; U+10ffff] range.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 186); [backlink](#)

Unknown interpreted text role "c:func".

Fix a bug that was causing the parser to crash when emitting syntax errors when reading input from stdin. Patch by Pablo Galindo

Fix a possible race condition where `PyErr_CheckSignals` tries to execute a non-Python signal handler.

Add `__match_args__` to `c:type: 'structsequence'` based classes. Patch by Pablo Galindo.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 218); [backlink](#)

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CPython now sets the `SA_ONSTACK` flag in `PyOS_setsig` for the VM's default signal handlers. This is friendlier to other in-process code that an extension module or embedding use could pull in (such as Golang's `cgo`) where tiny thread stacks are the norm and `sigaltstack()` has been used to provide for signal handlers. This is a no-op change for the vast majority of processes that don't use `sigaltstack`.

Speed up calls to `filter()` by using the [PEP 590](#) `vectorcall` calling convention. Patch by Dong-hee Na.

Add a radix tree based memory map to track in-use obmalloc arenas. Use to replace the old implementation of `address_in_range()`. The radix tree approach makes it easy to increase pool sizes beyond the OS page size. Boosting the pool and arena size allows obmalloc to handle a significantly higher percentage of requests from its ultra-fast paths.

It also has the advantage of eliminating the memory unsanitary behavior of the previous `address_in_range()`. The old `address_in_range()` was marked with the annotations `_Py_NO_SANITIZE_ADDRESS`, `_Py_NO_SANITIZE_THREAD`, and `_Py_NO_SANITIZE_MEMORY`. Those annotations are no longer needed.

To disable the radix tree map, set a preprocessor flag as follows: `-DWITH_PYMALLOC_RADIX_TREE=0`.

Co-authored-by: Tim Peters <tim.peters@gmail.com>

Only handle asynchronous exceptions and requests to drop the GIL when returning from a call or on the back edges of loops. Makes sure that `.meth: __exit__` is always called in with statements, even for interrupts.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 275); [backlink](#)

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Document various `stdlib` deprecations in `imp`, `pkgutil`, and `importlib.util` for removal in Python 3.12.

`class: 'xmlrpc.client.ServerProxy'` no longer ignores query and fragment in the URL of the server.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 296); [backlink](#)

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The `.meth: ~array.array.index` method of `class: 'array.array'` now has optional `start` and `stop` parameters.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-

main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 306); [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] 3.10.0a7.rst, line 306); [backlink](#)

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Enumr adjust `repr()` to show only enum and member name (not value, nor angle brackets) and `str()` to show only member name. Update and improve documentation to match.

Deprecate all module `_repr()` methods found in `importlib` as their use is being phased out by Python 3.12.

Raising an exception raised in a "future" instance will create reference cycles.

Finish updating the vendored `libmpdec` to version 2.5.1. Patch by Stefan Krah.

Revert the `_decimal` C API which was added in bpo-41324.

Fix deadlock when using `:class:'ssl.SSLContext'` debug callback with `:meth:'ssl.SSLContext.sni_callback'`.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 366); [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] 3.10.0a7.rst, line 366); [backlink](#)

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It's now possible to create MPTCP sockets with `IPPROTO_MPTCP`

`image/heic` and `image/heif` were added to `:mod:'mimetypes'`.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 385); [backlink](#)

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The `:mod:'hmac'` module now uses OpenSSL's HMAC implementation when `digestmod` argument is a hash name or builtin hash function.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 394); [backlink](#)

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Implement [PEP 597](#): Add `EncodingWarning` `warning`, `-X warn_default_encoding` option, `:envvar:'PYTHONWARNDEFAULTENCODING'` environment variable and `encoding="locale"` argument value.

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`ast.unparse` can now render NaNs and empty sets.

`:func:'pprint.pprint'` gains a new boolean `underscore_numbers` optional argument to emit integers with thousands separated by an underscore character for improved readability (for example `1_000_000` instead of `1000000`).

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 424); [backlink](#)

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`:meth:'~collections.deque.rotate'` calls are now slightly faster due to faster argument parsing.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-

main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 436); [backlink](#)

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:func:`subprocess.communicate` no longer raises an IndexError when there is an empty stdout or stderr IO buffer during a timeout on Windows.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 446); [backlink](#)

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Fixed long-standing bug of smtplib.SMTP where doing AUTH LOGIN with initial_response_ok=False will fail.

The cause is that SMTP.auth_login_always_ returns a password if provided with a challenge string, thus non-compliant with the standard for AUTH LOGIN.

Also fixes bug with the test for smtpd.

Add frozen modules to :data:`sys.stdlib_module_names`. For example, add "_frozen_importlib" and

"_frozen_importlib_external" names.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 472); [backlink](#)

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Add keyword arguments support to ChainMap.new_child().

Add optional parameter *ignore_cleanup_errors* to :func:`tempfile.TemporaryDirectory` and allow multiple :func:`cleanup` attempts. Contributed by C.A.M. Gerlach.

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 491); [backlink](#)

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Include changes from [importlib_metadata 3.7](#):

Performance enhancements to distribution discovery.

entry_points only returns unique distributions.

Introduces new `EntryPoints` object for containing a set of entry points with convenience methods for selecting entry points by group or name. `entry_points` now returns this object if selection parameters are supplied but continues to return a dict object for compatibility. Users are encouraged to rely on the selection interface. The dict object result is likely to be deprecated in the future.

Added `packages_distributions` function to return a mapping of packages to the distributions that provide them.

Improves the networking efficiency of :mod:`http.client` when using a proxy via :meth:`~HTTPConnection.set_tunnel`. Fewer small send calls are made during connection setup.

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 526); [backlink](#)

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Improve performance of :class:`fractions.Fraction` arithmetics for large components. Contributed by Sergey B. Kirpichev.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 537); [backlink](#)

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Allow passing a signal number to `_thread.interrupt_main()`.

Fix `ElementTree.extend` not working on iterators when using the Python implementation

Improve `mod:'sqlite3'` error handling: If `sqlite3_column_text()` and `sqlite3_column_blob()` set `SQLITE_NOMEM`, `exc:'MemoryError'` is now raised. Patch by Erlend E. Aasland.

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 566); [backlink](#)

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Fix a regression introduced in GH-24562, where an empty bytestring was fetched as `None` instead of `b''` in `mod:'sqlite3'`. Patch by Mariusz Felisiak.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 577); [backlink](#)

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Fixed stacklevel of `DeprecationWarning` emitted from `import distutils`.

`importlib.resources` now honors namespace packages, merging resources from each location in the namespace as introduced in `importlib_resources 3.2` and including incidental changes through `5.0.3`.

`meth:'datetime.datetime.strptime'` now raises `ValueError` instead of `IndexError` when matching `'z'` with the `%z` format specifier.

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Return empty string if `base64nime.body_encode` receive empty bytes

`func:'curses.window.enclose'` returns now `True` or `False` (as was documented) instead of `1` or `0`.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 628); [backlink](#)

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Add MIME types for opus, AAC, 3gpp and 3gpp2

Add an `invalidate_caches()` method to the `zipimport.zipimporter` class to support `importlib.invalidate_caches()`. Patch by Desmond Cheong.

Fail fast in `func:'shutil.move()` to avoid creating destination directories on failure.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 657); [backlink](#)

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Enum's `repr()` and `str()` have changed: `repr()` is now `EnumClass.MemberName` and `str()` is `MemberName`. Additionally, stdlib Enum's whose contents are available as module attributes, such as `RegexFlag.IGNORECASE`, have their `repr()` as `module.name`, e.g. `re.IGNORECASE`.

Fixed bug where the `mod:'pdb'` interactive run command echoed the args from the shell command line, even if those have been overridden at the `pdb` prompt.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 680); [backlink](#)

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Fixed bug where breakpoints did not persist across multiple debugger sessions in `mod: pdb`'s interactive mode.

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When the `:data: tempfile.tempdir` global variable is set to a value of type bytes, it is now handled consistently. Previously exceptions could be raised from some tempfile APIs when the directory did not already exist in this situation. Also ensures that the `:func: tempfile.gettempdir()` and `:func: tempfile.gettempdirb()` functions *always* return `str` and `bytes` respectively.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 701); [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] 3.10.0a7.rst, line 701); [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] 3.10.0a7.rst, line 701); [backlink](#)

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Expose `X509_V_FLAG_ALLOW_PROXY_CERTS` as `:data: ~ssl.VERIFY_ALLOW_PROXY_CERTS` to allow proxy certificate validation as explained in <https://www.openssl.org/docs/man1.1.1/man7/proxy-certificates.html>.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 715); [backlink](#)

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Add `builtins.aiter` and `builtins.anext`. Patch by Joshua Bronson (@jab), Daniel Pope (@lordmauve), and Justin Wang (@justin39).

Answer "Why is there no goto?" in the Design and History FAQ.

Clarified that a result from `:func: time.monotonic`, `:func: time.perf_counter`, `:func: time.process_time`, or `:func: time.thread_time` can be compared with the result from any following call to the same function - not just the next immediate call.

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 746); [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] 3.10.0a7.rst, line 746); [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] 3.10.0a7.rst, line 746); [backlink](#)

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Fix type documentation for `Fault.faultCode`; the type has to be `int` instead of `str`.

Clarified wording of `s * n` in the Common Sequence Operations

Fix `test_getsetlocale_issue1813()` of `test_locale`: skip the test if `setlocale()` fails. Patch by Victor Stinner.

Add workaround for Ubuntu's custom OpenSSL security level policy.

Introduce and correctly use `ALIGNOF_X` in place of `SIZEOF_X` for alignment-related code in optimized string routines. Patch by Jessica Clarke.

Update macOS, Windows, and CI to OpenSSL 1.1.1k.

Improve `configure.ac`: Check for presence of `autoconf-archive` package and remove our copies of M4 macros.

The `configure` script now supports `--with-openssl-rpath` option.

Use `_freeze_importlib` to generate code for the `__hello__` module. This approach ensures the code matches the interpreter version. Previously, `PYTHON_FOR_REGEN` was used to generate the code, which might be wrong. The marshal format for code objects has changed with bpo-42246, commit 877df851. Update the code and the expected code sizes in `ctypes test_frozentable`.

Build `mod:'sqlite3'` with the `R*Tree` module enabled. Patch by Erlend E. Aasland.

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Unknown interpreted text role "mod".

Document that IDLE can fail on Unix either from misconfigured IP masquerade rules or failure displaying complex colored (non-ascii) characters.

The limited C API is now supported if Python is built in debug mode (if the `Py_DEBUG` macro is defined). In the limited C API, the `c:func:'Py_INCREF'` and `c:func:'Py_DECREF'` functions are now implemented as opaque function calls, rather than accessing directly the `c:member:'PyObject.ob_refcnt'` member, if Python is built in debug mode and the `Py_LIMITED_API` macro targets Python 3.10 or newer. It became possible to support the limited C API in debug mode because the `c:type:'PyObject'` structure is the same in release and debug mode since Python 3.8 (see [issue:'36465'](#)).

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System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 868); [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] 3.10.0a7.rst, line 868); [backlink](#)

Unknown interpreted text role "c:member".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 868); [backlink](#)

Unknown interpreted text role "c:type".

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d] 3.10.0a7.rst, line 868); [backlink](#)

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The limited C API is still not supported in the `--with-trace-refs` special build (`Py_TRACE_REFS` macro).

Patch by Victor Stinner.

Remove the `pyarena.h` header file with functions:

- `PyArena_New()`
- `PyArena_Free()`
- `PyArena_Malloc()`
- `PyArena_AddPyObject()`

These functions were undocumented, excluded from the limited C API, and were only used internally by the compiler. Patch by Victor Stinner.

Remove the compiler and parser functions using `struct _mod` type, because the public AST C API was removed:

- `PyAST_Compile()`
- `PyAST_CompileEx()`
- `PyAST_CompileObject()`
- `PyFuture_FromAST()`
- `PyFuture_FromASTObject()`
- `PyParser_ASTFromFile()`
- `PyParser_ASTFromFileObject()`
- `PyParser_ASTFromFilename()`
- `PyParser_ASTFromString()`
- `PyParser_ASTFromStringObject()`

These functions were undocumented and excluded from the limited C API. Patch by Victor Stinner.

Remove `ast.h`, `asdl.h`, and `Python-ast.h` header files. These functions were undocumented and excluded from the limited C API. Most names defined by these header files were not prefixed by `Py` and so could create names conflicts. For example, `Python-ast.h` defined a `Yield` macro which was conflict with the `Yield` name used by the Windows `<winbase.h>` header. Use the Python `mod:`ast`` module instead. Patch by Victor Stinner.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d]3.10.0a7.rst, line 931); [backlink](#)

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Fix a `PyEval_EvalCodeEx()` regression: fix reference counting on builtins. Patch by Victor Stinner.

Remove the `symtable.h` header file and the undocumented functions:

- `PyST_GetScope()`
- `PySymtable_Build()`
- `PySymtable_BuildObject()`
- `PySymtable_Free()`
- `Py_SymtableString()`
- `Py_SymtableStringObject()`

The `Py_SymtableString()` function was part the stable ABI by mistake but it could not be used, because the `symtable.h` header file was excluded from the limited C API.

The Python `mod:`symtable`` module remains available and is unchanged.

System Message: ERROR/3 (D:\onboarding-resources\sample-onboarding-resources\cpython-main\Misc\NEWS.d\ [cpython-main] [Misc] [NEWS.d]3.10.0a7.rst, line 969); [backlink](#)

Unknown interpreted text role "mod".

Patch by Victor Stinner.

Remove the `PyAST_Validate()` function. It is no longer possible to build a AST object (`mod_ty` type) with the public C API. The function was already excluded from the limited C API (PEP 384). Patch by Victor Stinner.