



과학기술정보통신부

nipa 정보통신산업진흥원  
National IT Industry Promotion Agency



2021

공개SW

페스티벌

ONLINE FESTIVAL



개발자와  
함께  
성장하는  
오픈소스

# CPython 개발 프로세스와 운영시스템

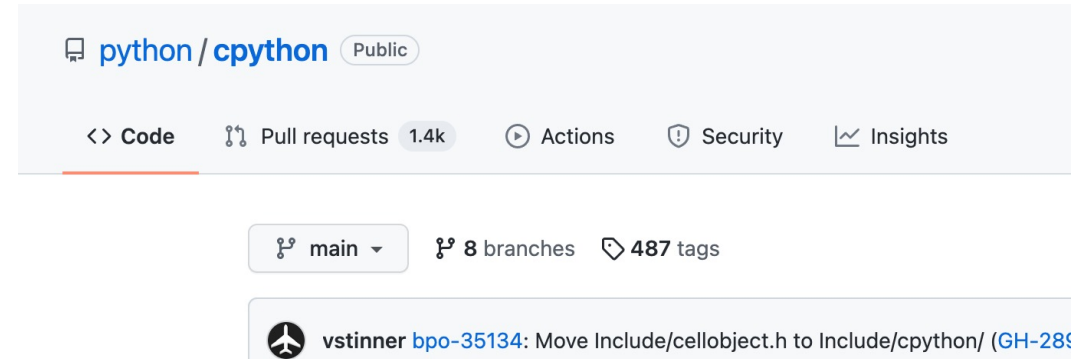
소속 : LINE  
이름 : 나동희

# 발표자 소개

- LINE 소프트웨어 엔지니어: 2021 - Current
- 카카오 소프트웨어 엔지니어: 2018 - 2021
  
- CPython Core Developer (aka Commiter): 2020.04 - Current
- CPython Triage Member: 2019.09 - 2020.04

# CPython 이란?

- Python 언어의 C언어 기반의 구현체
- <https://www.python.org/downloads/> 에서 다운로드하여 설치 할 수 있음
- 다른 구현체로는 PyPy, RustPython 등이 있음
- GitHub에서 소스코드를 관리하고 있음
- 2021년 10월 현재 파이썬 3.11을 개발 중



# CPython 이슈 트래커

- <https://bugs.python.org> 에서 이슈들을 관리 중
- PEP 581이 승인됨에 따라 앞으로는 GitHub의 이슈트래커를 사용 할 예정

The screenshot shows the Python bug tracker interface. At the top, there is a search bar and navigation options for 'open' and 'all'. Below the search bar, there is a sidebar with navigation links: PYTHON HOME, ABOUT, NEWS, DOCUMENTATION, DOWNLOADS, COMMUNITY, FOUNDATION, DEVELOPER'S GUIDE, and ISSUE TRACKER. The main content area displays a table of issues with columns for ID, Activity, Title, Status, Creator, Assigned To, Type, and Msgs.

ID	Activity	Title	Status	Creator	Assigned To	Type	Msgs
45420	1 3/4 hours ago	Python 3.10 final installation failure	open	wyz23x2		crash	3
45478	2 hours ago	Send a patch to libexpat to solve <code>_POSIX_C_SOURCE</code> issue.	open	corona10	corona10	enhancement	1
45465	3 hours ago	logging messages are needlessly reformatted for every handler	open	SpecLad		enhancement	1
35134	4 hours ago	Add a new <code>Include/cpython/</code> subdirectory for the "CPython API" with implementation details	open	vstinner			54
45443	4 hours ago	'ThreadPoolExecutor' object has no attribute 'map'	pending	zohim		behavior	4
45476	4 hours ago	[C API] Convert "AS" functions, like <code>PyFloat_AS_DOUBLE()</code> , to static inline functions	open	vstinner			4
45434	4 hours ago	[C API] Clean-up the <code>Python.h</code> header file	open	vstinner			14
45473	5 hours ago	Enum add "from_name" and "from_value" class methods	open	aekoch	ethan.furman	enhancement	3
45442	6 hours ago	Update 'Virtual Environment' tutorial	open	shivnaren	docs@python		2
29595	6 hours ago	Expose <code>max_queue_size</code> in <code>ThreadPoolExecutor</code>	open	prayerslayer		enhancement	6
21736	7 hours ago	Add <code>__file__</code> attribute to frozen modules	open	lemburg			10
45477	7 hours ago	configure script cannot detect float word ordering on linux	open	sourish.basu		compile error	1
45475	7 hours ago	gzip fails to read a gzipped file ( <code>ValueError: readline of closed file</code> )	open	minstrelofc		behavior	1
45417	7 hours ago	Enum creation non-linear in the number of values	open	olliemath		performance	5
45395	7 hours ago	Frozen <code>stdlib</code> modules are discarded if custom frozen modules added.	open	eric.snow		behavior	6
45468	7 hours ago	Add support for preloading a Python script	open	Gabriele Toretta		enhancement	6
45452	8 hours ago	Support crash tolerance feature for <code>gdbm</code> module	open	corona10	corona10	enhancement	15

# CPython 개발팀 구성

명칭	권한	선정기준
Triage Member	이슈 분류 / PR 라벨링 / CI	Core Developer 추천
Core Developer	코드 커밋 권한 / PEP 스폰서 가능	기존 Core Developer 투표
Release Manager	릴리즈 계획 및 실행 수립	현 Release Manager가 지목
Steering Council Member	파이썬 로드맵 결정 / PEP 승인	Core Developer 내부 투표

# CPython 릴리즈 사이클

- PEP 602의 기준에 따라 개발 및 사후 지원을 하고 있음
- 17개월 단위로 새로운 메이저 버전을 출시함
- 출시 이후 1년 6개월 동안 버그 및 보안 이슈에 대한 사후 지원을 함.
- 버그 수정 지원 기간이 지난 이후로는 3년 6개월에 걸쳐 보안 이슈에 대해서만 지원을 함.

# CPython 릴리즈 현황

버전	현황	EOL
3.11 (dev)	개발 중	2027-10
3.10	버그 수정 + 보안 이슈 지원	2026-10
3.9	버그 수정 + 보안 이슈 지원	2025-10
3.8	보안 이슈 지원	2024-10
3.7	보안 이슈 지원	2023-06-27
3.6	보안 이슈 지원	2021-12-23



# CPython 개발 프로세스 (1)

- 기본적으로 이슈 트래커에 먼저 이슈를 올리는게 원칙
- 이슈 트래커 올라온 이슈에 대해서 어떻게 대응할지 Core Developer들을 중심으로 결정함
- 규모가 큰 변화는 별도의 PEP을 작성한 것을 요구하여 SC의 승인을 받아야함.

## Messages (9)

[msg404380](#) - (view)

Author: [Ezio Melotti \(ezio.melotti\)](#) \*

Date: 2021-10-20 08:40

```
sys.version returns '3.10.0 (default, Oct 5 2021, 23:49:26) [GCC 10.2.1 20210110]'
```

'default' is supposed to represent the name of the branch, and it's been there since the HG days:  
<https://github.com/python/cpython/blob/fc64c351c7757f0ebdb7da65cb74871e494a2add/Modules/getbuildinfo.c#L44>

When the code was updated for Git in [#27593](#), the default remained the same:  
<https://github.com/python/cpython/blob/bb3e0c240bc60fe08d332ff5955d54197f79751c/Modules/getbuildinfo.c#L44>

The default should be updated to 'main'.

Note that `_Py_gitidentifier` is supposed to return meaningful values while building from within a git checkout -- when it fails to do so the default value is used. This can also be tested through `sys._git` (which returns ('CPython', '', '')), but at the moment I can't build from a git checkout and verify that `_Py_gitidentifier` returns the correct branch. If not, a separate issue should be created.

[msg404383](#) - (view)

Author: [Dong-hee Na \(corona10\)](#) \*

Date: 2021-10-20 10:32

```
+1
```

[msg404384](#) - (view)

Author: [Dong-hee Na \(corona10\)](#) \*

Date: 2021-10-20 11:12

```
> youknowone  
Do you want to take a look?
```

# CPython 개발 프로세스 (2)

- GitHub를 통해서 패치를 제출하고, Core Developer의 승인을 받아 머지하게 됨.
- 만약에 버그 픽스나 보안 이슈 일 경우 **자동화된 Backport 패치 프로세스를 통해서 하위 버전도 지원** 하게 됨.

The screenshot shows a GitHub pull request interface. At the top, there are tabs for 'Conversation' (10), 'Commits' (1), 'Checks' (9), and 'Files changed' (2). A comment by 'youknowone' is highlighted with a blue circle containing the number '1'. The comment text is 'youknowone commented 3 days ago · edited by bedevere-bot' and includes a link to 'https://bugs.python.org/issue45532'. Below the comment, three labels are added to the pull request: 'awaiting review' by 'bedevere-bot', 'CLA signed' by 'the-knights-who-say-ni', and 'needs backport to 3.9' and 'needs backport to 3.10' by 'corona10'. All labels were added 3 days ago.

# CPython 개발 프로세스 (3)

- GitHub를 통해서 패치를 제출하고, Core Developer의 승인을 받아 머지하게 됨.
- 만약에 버그 픽스나 보안 이슈 일 경우 **자동화된 Backport 패치 프로세스를 통해서 하위 버전도 지원** 하게 됨.



bedevere-bot commented 3 days ago

Member



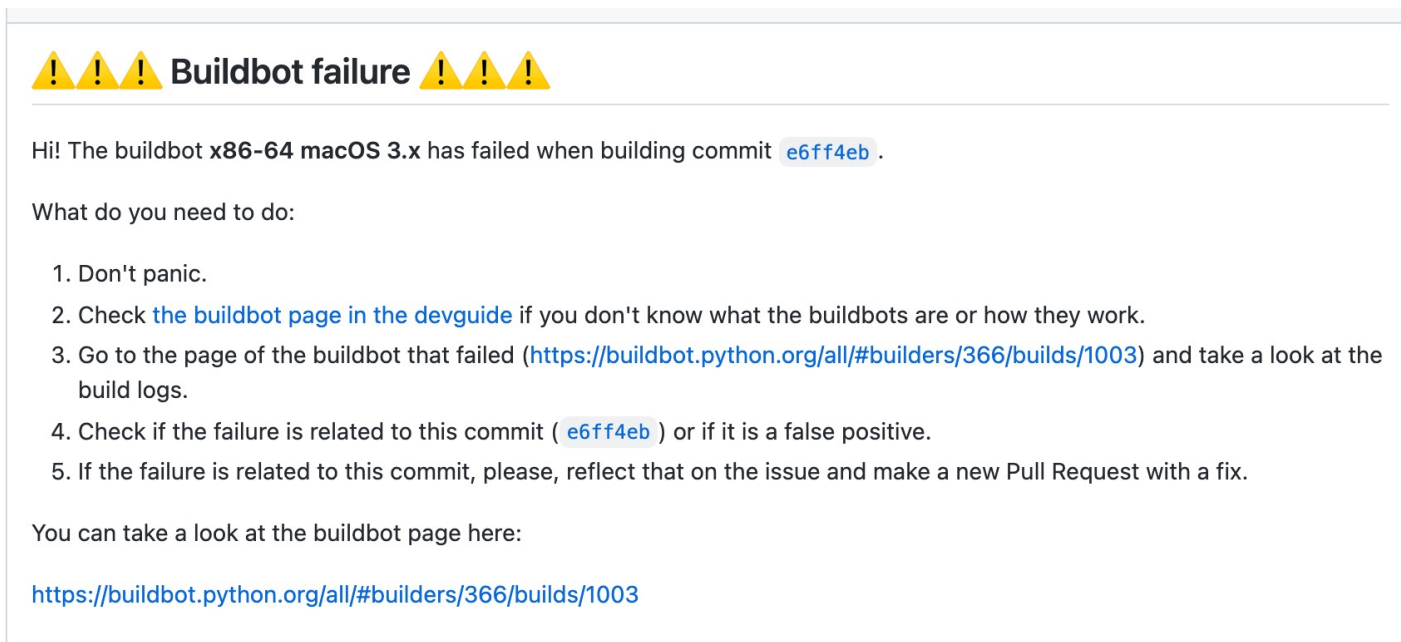
[GH-29106](#) is a backport of this pull request to the [3.10 branch](#).



bedevere-bot removed the **needs backport to 3.10** label 3 days ago

# CPython 개발 프로세스 (4)

- 패치가 머지가 된 후로 리그레션이 발생하거나, 메모리 누수 이슈가 발생이 되면 원복을 하게 됨.
- 리그레션 / 메모리 누수 검사는 시간이 매우 오래 걸리기 때문에 자동화된 CI 프로세스를 통해서 검사함.



!!! Buildbot failure !!!

Hi! The buildbot x86-64 macOS 3.x has failed when building commit [e6ff4eb](#) .

What do you need to do:

1. Don't panic.
2. Check [the buildbot page in the devguide](#) if you don't know what the buildbots are or how they work.
3. Go to the page of the buildbot that failed (<https://buildbot.python.org/all/#builders/366/builds/1003>) and take a look at the build logs.
4. Check if the failure is related to this commit ( [e6ff4eb](#) ) or if it is a false positive.
5. If the failure is related to this commit, please, reflect that on the issue and make a new Pull Request with a fix.

You can take a look at the buildbot page here:

<https://buildbot.python.org/all/#builders/366/builds/1003>

# CPython 코어팀 관련 행사

- Python Language Summit: PyConUS에서 열리는 비공개 행사, 파이썬 구현체와 관련된 실험이나 로드맵에 대해서 발표하는 자리
- Python Core Sprint: 약 일주일 간 진행되는 비공개 행사로, Core Developer와 Triage Member들이 모여 실질적인 코드 작업과 리뷰를 집중적으로 하는 모임

Thursday, May 13, 2021

## The 2021 Python Language Summit

Every year, a small group of core developers from Python implementations such as CPython, PyPy, Jython, and more come together to share information, discuss problems, and seek consensus in order to help Python continue to flourish.

The Python Language Summit features short presentations followed by group discussions. The topics can relate to the language itself, the standard library, the development process, documentation, packaging, and more! In 2021, the summit was held over two days by videoconference and was led by Mariatta Wijaya and Łukasz Langa.

If you weren't able to attend the summit, then you can still stay up to date with what's happening in the world of Python by reading blog posts about all of the talks that were given. Over the next few weeks, you'll be able to dive into all of the news from the summit so you can join in on the big conversations that are happening in the Python community.

## Python Core Sprint 2020

Issue Tracker and Discussions: <https://github.com/python/core-sprint>

For questions and suggestions about the sprint, please open an issue or a discussion item in the [core-sprint](#) repo.

For sensitive and private discussions, please get in touch with one of the organizers: Mariatta, Kyle Stanley or Ewa Jodlowska.

The sprint is scheduled for **Oct 19 – 23, 2020**. This will be an online event instead of the in-person sprint.

The sprint is normally a weeklong (5 work days) sprint, where we would have focus time to work on CPython, finish your PEPs, review pull requests, etc.

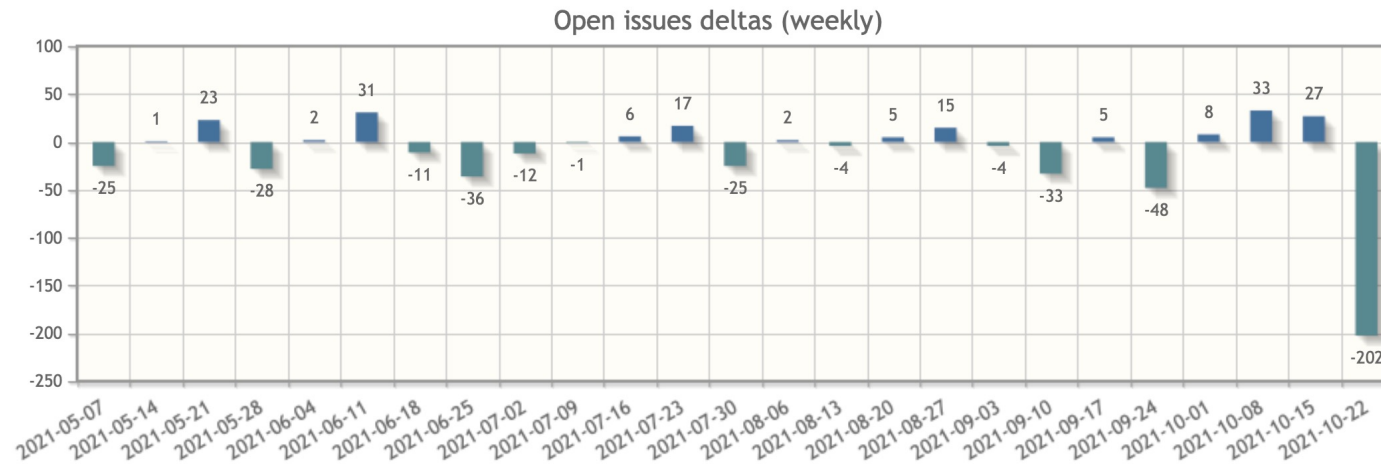
# Python Language Summit 2021

- 코로나로 인해 비대면으로 진행 (2일)
- Faster CPython Project
- Hpy
- Instagram Cinder
- Multi Core Subinterpreter Project
- Jython3
- PSF 블로그에서 해당 내용들이 정리가 되어있음:

<https://pyfound.blogspot.com/2021/05/the-2021-python-language-summit.html>

# Python Core Sprint 2021

- Language Summit과 마찬가지로 비대면으로 진행 (7일)
- 그 동안 밀렸던 코드 리뷰를 처리
- CPython 개선을 위한 다양한 실험 등을 진행



# Python Core Sprint 2021

- Language Summit과 마찬가지로 비대면으로 진행 (7일)
- 그 동안 밀렸던 코드 리뷰를 처리
- CPython 개선을 위한 다양한 실험 등을 진행

```

msg404706 - (view) Author: Dong-hee Na (corona10) * 🇵🇹 Date: 2021-10-22 08:20
New changeset 83f202a802b0810e2f0900c6d298fd104390f2ba by Dong-hee Na in branch 'main':
bpo-43706: Use PEP 590 vectorcall to speed up enumerate() (GH-25154)
https://github.com/python/cpython/commit/83f202a802b0810e2f0900c6d298fd104390f2ba

msg404707 - (view) Author: Dong-hee Na (corona10) * 🇵🇹 Date: 2021-10-22 08:23
Thanks Victor!

msg404717 - (view) Author: Dong-hee Na (corona10) * 🇵🇹 Date: 2021-10-22 10:59
@vstinner
I noticed that the msg390083 was based on a non-optimized build.
https://github.com/python/cpython/pull/25154#issuecomment-949061515 ran with the same build option condition.
Here is the PGO + LTO based benchmark.
Still fast.

+-----+-----+-----+
| Benchmark | base_opt | vectorcall_opt |
+-----+-----+-----+
| bench enumerate | 384 ns | 277 ns: 1.39x faster |
+-----+-----+-----+

```



# Python Core Sprint 2021

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- CPython 개선을 위한 다양한 실험 등을 진행

tiran commented 2 days ago

Member

Vendor and hook up `mimalloc` as memory allocator and replacement for `pymalloc`.

- Includes mimalloc v1.7.1 and two additional fixes
- `--with-mimalloc=yes` by default (for testing)
- `--with-pymalloc=no` by default
- `--with-freelists=yes`

```
>>> sys._debugmallocstats()
mimalloc (version: 171)
heap stats:  peak    total    freed    current    unit    count
reserved:  256.0 mb  256.0 mb    0 b    256.0 mb    1 b    not all freed!
committed:  20.0 mb   20.0 mb    0 b    20.0 mb    1 b    not all freed!
reset:      1.0 mb    1.0 mb    0 b    1.0 mb    1 b    not all freed!
touched:    0 b       0 b    932.3 kb  -932.3 kb    1 b    ok
segments:   5         5         1         4          ok
-abandoned: 0         0         0         0          ok
-cached:    0         0         0         0          ok
pages:      94        123       29        94         not all freed!
-abandoned: 0         0         0         0          ok
-extended:  0
-noretire:  0
mmaps:      0
commits:    69
threads:    0         0         0         0          ok
searches:   0.0 avg
numa nodes: 1
elapsed:    5.572 s
process: user: 0.073 s, system: 0.007 s, faults: 0, rss: 11.9 mb, commit: 20.0 mb
...
```

# 감사합니다



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