

PyCon China 2024

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2024/11/23 中国 上海



深入Python debugger及其演进

The screenshot shows a GitHub repository interface. At the top, the repository name 'slides' and the user 'tao12345666333' are displayed. Below this is a navigation bar with tabs for 'Code', 'Issues', 'Pull requests', 'Actions', 'Projects', 'Wiki', and 'Security'. The 'Code' tab is selected. On the left side, there is a 'Files' section with a dropdown menu set to 'master'. Below the dropdown is a search bar labeled 'Go to file'. A list of folders is shown, with '2017.10.21-Python-Meetup' selected and expanded. This folder contains a file named 'Python性能优化-TaoBeier@me...'. On the right side, the path 'slides / 2017.10.21-Python-Meetup /' is shown. Below this, there is a commit history section showing a commit by 'tao12345666333' titled 'Update slides'. Below the commit history is a table with the following content:

Name
..
Python性能优化-TaoBeier@meitu.pdf

<https://github.com/tao12345666333/slides/>

About Me



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- CNCF Ambassador
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- Microsoft MVP
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什么是Python debugger

- pdb - The Python Debugger
- 断点/执行
- 运行时信息
- IDE/Editor with debugger
- ...

```
#!/usr/bin/env python3
import os
import kong_pdk.pdk.kong as kong

Schema = (
    {"message": {"type": "string"}}},
)

version = '0.1.0'
priority = 0

# This is an example plugin that add a header to the response

class Plugin(object):
    def __init__(self, config):
        self.config = config

    def access(self, kong: kong.kong):
        host, err = kong.request.get_header("host")
        if err:
            pass
        message = "hello"
        if 'message' in self.config:
            message = self.config['message']
        kong.response.set_header("x-hello-from-python", "Python says %s to %s" % (message, host))
        kong.response.set_header("x-python-pid", str(os.getpid()))

# add below section to allow this plugin optionally be running in a dedicated process
if __name__ == "__main__":
    from kong_pdk.cli import start_dedicated_server
    start_dedicated_server("py-hello", Plugin, version, priority, Schema)
```

- Kong Python Plugin
- 需要持续运行
- 不断处理请求

设置 debugger

- `pdb.set_trace()`

Python v3.13

立即执行,不换行

- `breakpoint()`

Python v3.7

PEP-553



```
import pdb
```

```
pdb.set_trace()
```

深入 debugger

```
1
389 def set_trace(self, frame=None):
1   """Start debugging from frame.
2
3   If frame is not specified, debugging starts from caller's frame.
4   """
5   sys.settrace(None)
6   if frame is None:
7       frame = sys._getframe().f_back
8   self.reset()
9   self.enterframe = frame
10  while frame:
11      frame.f_trace = self.trace_dispatch
12      self.botframe = frame
13      self.frame_trace_lines_opcodes[frame] = (frame.f_trace_lines, frame.f_trace_opcodes)
14      # We need f_trace_lines == True for the debugger to work
15      frame.f_trace_lines = True
16      frame = frame.f_back
17  self.set_stepinstr()
18  sys.settrace(self.trace_dispatch)
19
```


PEP 669 – Low Impact Monitoring for CPython

- 与帧关联 vs 与代码对象关联
- 新增 15+ events
- 新增 `sys.monitoring`
- 很难兼容 `bdb` 接口

```
help on module sys.monitoring in sys:
```

NAME

```
sys.monitoring
```

FUNCTIONS

```
free_tool_id(tool_id, /)
```

```
get_events(tool_id, /)
```

```
get_local_events(tool_id, code, /)
```

```
get_tool(tool_id, /)
```

```
register_callback(tool_id, event, func, /)
```

```
restart_events()
```

```
set_events(tool_id, event_set, /)
```

```
set_local_events(tool_id, code, event_set, /)
```

```
use_tool_id(tool_id, name, /)
```

DATA

```
COVERAGE_ID = 1
```

```
DEBUGGER_ID = 0
```

```
DISABLE = <object object>
```

```
MISSING = <object object>
```

```
OPTIMIZER_ID = 5
```

```
PROFILER_ID = 2
```

```
events = namespace(PY_START=1, PY_RESUME=2, PY_RETURN=4, ...638)
```

Thanks!

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