# PWN简介与学习方法

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# 内容简介

INTRODUCTION

# PWN简介

**软件安全：软件安全专注于研究软件的设计和实现的安全**

- 研究对象：代码（源码、字节码、汇编等）
- 研究目标：发掘漏洞、利用漏洞、修补漏洞
- 研究技术：逆向工程、漏洞挖掘与利用、漏洞防御技术

**CTF PWN：软件安全研究的一个缩影**

- 研究对象：可执行文件，主要是ELF文件
- 研究最终目标：夺取flag

**软件安全与CTF PWN特点：入门难、进阶难、精通难**

# PWN简介

## 工具

- 静态分析：IDA Pro
- 动态调试：gdb(with peda or gef)、windbg、ollydbg
- Exploit：pwntools、zio

## 前置技能

- 汇编语言：程序执行、函数栈帧、函数调用等
- 编译、链接、装载、执行
- ELF文件结构
- Linux系统相关：文件描述符、系统调用、socket编程、shell命令

# PWN学习方法

**痛苦：**

- 对于没有入门PWN的人，最最基础的PWN题也可能会让你想破脑袋也想不明白 ->放弃
- 对于刚刚入门的PWN的人，做进阶的PWN题很容易让你头脑发胀，难以继续 ->放弃
- 对于已经具有一定水平的PWN手，利用比较难的题目需要审计大量汇编、让人头昏脑胀 ->放弃

**学习PWN需要最重要的品质：永不言弃！！！**

**怎样玩好LOL？ lu多了就会lu了。**

**怎样学好PWN？ PWN多了就会PWN了。**

**被PWN题恶心的要死怎么办？被恶心多了就习惯了！**

# PWN学习方法

**学习阶段一：学习套路**

- 套路是有限的，假以时日一定会学完的招式
- 针对每种套路都练习1～2道习题

**学习完所有常见套路，大多数国内比赛的中档题基本都可以随便切**

**学习阶段二：总结套路，变套路为艺术**

- 漏洞利用是一门艺术，难以用套路完全概括，要想切难题不能完全靠套路
- 多刷刷国际赛的难题，刷的慢没关系，刷多了自然就会融会贯通
- 多总结思考现有的套路的本质

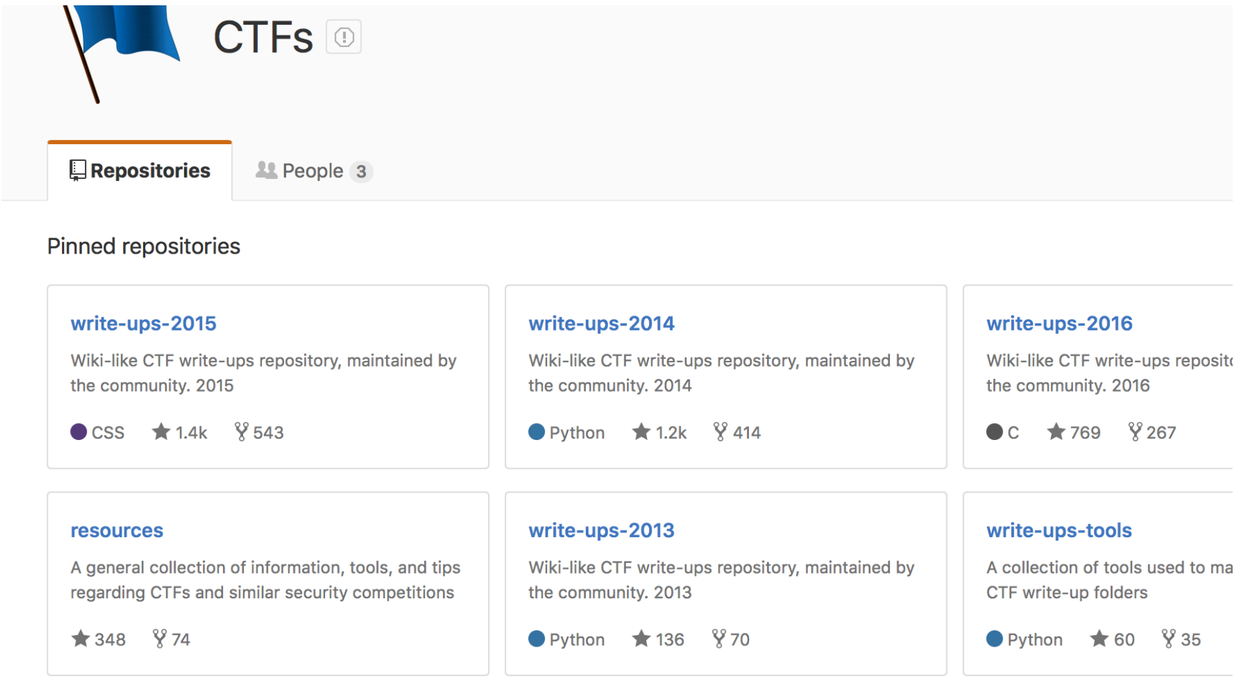
**本课程后续内容主要是介绍各种常见的套路，并提供学习资料链接与习题**

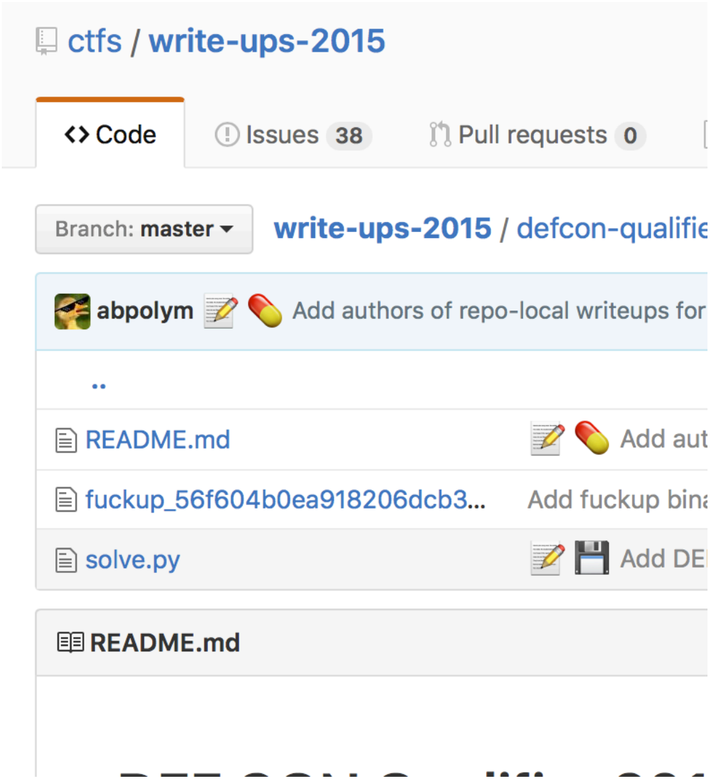
# PWN学习方法

**资源：**

**CTF Writeup Github：https://github.com/ctfs**

**聚合了各大国际比赛的习题文件以及writeup**



# PWN学习方法

## Googling：XXX Writeup or XXX CTF

## 不要百度，因为百度收录不了github pages

shitsco writeup

全部 图片 新闻 地图 视频 更多 搜索工具

找到约 370 条结果 （用时 0.45 秒）

小提示： 仅限搜索简体中文结果。您可以在设置中指定搜索语言

Defcon Quals writeup for Shitsco (use-after-free vuln) » SkullSecurity
https://blog.skullsecurity.org/.../defcon-quals-**writeup**-for-**shitsco**-use-after-fr... ▾ 翻译此页
2014年5月21日 - Hey folks,. Apparently this blog has become a CTF writeup blog! Hopefully you don't mind, I still try to keep all my posts educational. Anyway ...

write-ups-2014/def-con-ctf-qualifier-2014/shitsco at master · ctfs/write ...
https://github.com/ctfs/**write-ups**-2014/tree/master/def-con-ctf.../**shitsco** ▾ 翻译此页
Write-up. Shitsco is a small router emulator. It allows you to ping, to tracert, to use the shell (Yhea, right! :D) and to set and view variables. As we smell a rat in the ...

DEFCON 2014 Writeup shitsco · GitHub
https://gist.github.com/3aa0858e2f540716c832 ▾ 翻译此页
from struct import pack. from socket import *. from pwn import process. #p = process("shit"). p = socket(AF_INET, SOCK_STREAM).

double free ctf

全部 图片 视频 新闻 地图 更多 搜索工具

找到约 93,200 条结果 （用时 0.36 秒）

小提示： 仅限搜索简体中文结果。您可以在设置中指定搜索语言

Advanced Heap Exploitation: 0CTF 2015 'freenote' writeup - kitctf
https://kit**ctf**.de/writeups/0**ctf**2015/**free**note ▾ 翻译此页
2015年3月30日 - struct malloc_chunk* fd; /* double links -- used only if free. ..... which directly spawns /bin/sh when we jump to it (from [Dragon's notes on CTF]).

0ctf 2015 Freenote Write Up - Winesap's Blog - Logdown
winesap.logdown.com/posts/258859-0**ctf**-2015-**free**note-write-up ▾ 转为简体网页
2015年3月30日 - March 30, 2015 | 2 Comments. Double free 漏洞利用，順便來試試之前想到的某個好用的 unlink() 利用法，建議對heap exploitation 先有一些瞭解 ...

# PWN学习案例-ROP

## ROP：现代栈溢出中最基础的利用技术（最简单最基础的套路）

## Googling 筛选到比较好的题目：r0pbaby

ctf ROP

全部 图片 视频 新闻 地图 更多 搜索工具

找到约 114,000 条结果 （用时 0.27 秒）

小提示： 仅限搜索简体中文结果。您可以在设置中指定搜索语言

Binary Exploits 2 | CTF Field Guide
https://trailofbits.github.io/**ctf**/exploits/binary2.html ▾ 翻译此页
In this module, we continue to examine the ways that native applications can be exploited and focus on using return-oriented programming (ROP) to achieve that ...

write-ups-2013/pico-ctf-2013/rop-2 at master · ctfs/write-ups ... - GitHub
https://github.com/**ctf**s/write-ups-2013/tree/master/pico-**ctf**-2013/**rop**-2 ▾ 翻译此页
ROP is a classic technique for getting around address randomization and non- executable memory. This sequence will teach you the basics. Problem available ...

Defcon Quals: r0pbaby (simple 64-bit ROP) » SkullSecurity
https://blog.skullsecurity.org/2015/defcon-quals-r0pbaby-simple-64-bit-**rop** ▾ 翻译此页
2015年5月20日 - This past weekend I competed in the Defcon CTF Qualifiers from the Legit ... ROP - return-oriented programming - is an exploitation technique ...

# PWN学习案例-ROP

## 学习writeup，可以参考多篇writeup，查询不懂的名词

### Defcon Quals: r0pbaby (simple 64-bit ROP)

1 Reply

This past weekend I competed in the Defcon CTF Qualifiers from the Legit Business Syndicate. In the past it's bee
competitions, and this year was no exception!

Unfortunately, I got stuck for quite a long time on a 2-point problem ("wwtw") and spent most of my weekend o
others - r0pbaby included - and am excited to write about them, as well!

r0pbaby is neat, because it's an absolute bare-bones ROP (return-oriented programming) level. Quite honestly,
actually prefer using a ROP chain to using shellcode. Much of the time, it's actually easier! You can see the binary
other stuff I used on this github repo.

It might make sense to read a post I made in 2013 about a level in PlaidCTF called ropasaurusrex. But it's not rea
going to explain the same stuff again with two years more experience!

#### What is ROP?

Most modern systems have DEP - data execution prevention - enabled. That means that when trying to run arbit
has be in memory that's executable. Typically, when a process is running, all memory segments are either writab
(+x) - not both. That's sometimes called "W^X", but it seems more appropriate to just call it common sense.

### Return-oriented programming

From Wikipedia, the free encyclopedia

**Return-oriented programming** (**ROP**) is a computer security exploit technique that allows an attacker t
code signing.[1]

In this technique, an attacker gains control of the call stack to hijack program control flow and then execu
typically ends in a return instruction and is located in a subroutine within the existing program and/or sha
operations on a machine employing defenses that thwart simpler attacks.

**Contents** [hide]



#### Background [ edit ]

# PWN学习案例-ROP

根据Writeup和学到的内容自己动手调试一下，尽量自己手动重写exploit

重写exploit成功：基本掌握了ROP

```
(gdb) b *0x555555554000+0xe53
Breakpoint 1 at 0x555555554e53
(gdb) c
Continuing.
Stopped due to shared library event:
  Inferior loaded /lib/x86_64-linux-gnu/libdl.so.2
    /lib/x86_64-linux-gnu/libc.so.6
(gdb)
Continuing.

Welcome to an easy Return Oriented Programming challenge...
Menu:
Stopped due to shared library event (no libraries added or removed)
(gdb)
Continuing.
1) Get libc address
2) Get address of a libc function
3) Nom nom r0p buffer to stack
4) Exit
: 3
Enter bytes to send (max 1024): 8
AAAAAAA

Breakpoint 1, 0x0000555555554e53 in ?? ()
(gdb) x/12wx $rsp
0x7fffffffe140: 0xf7814d28      0x00007fff      0xf7ff79b0      0x00007fff
0x7fffffffe150: 0x41414141      0x0a414141      0x01f25bc2      0x00000000
0x7fffffffe160: 0xffffe270      0x00007fff      0xf7de4991      0x00007fff
(gdb) x/4x $rbp
0x7fffffffe590: 0x41414141      0x0a414141      0xf7832ec5      0x00007fff
```

# The End