Binary Exploitation I — Summer 24

Practical Course

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What is this?

Exploiting buggy C programs on modern x86_64 Linux systems.

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[2] Disclaimer: There might be a little 32-bit x86 as well...
[3] Just kidding — no Windows (yet). We kindly refer you to abx.☺

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- ...understand how computers work
- ...know the basics of the Intel x86 assembly language
- ...have a reasonable grasp of the C programming language

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...but **most importantly**:

- ...enjoy banging your head against tough challenges

Process

Phase I ($\sim$ 10 weeks):

- "Usual" practical course (weekly meetings and assignments)

Phase II ($\sim$ 4 weeks):

- Final project (vulnerable program, exploit and presentation)

Team	pwn00	pwn01	pwn02	pwn03	pwn04	pwn05	pwn06	pwn07	pwn08	pwn09	pwn10	pwn11	pwn12	pwn13	pwn14	pwn15	pwn16	pwn17	pwn18	pwn19	pwn20	pwn21	pwn22	pwn23	pwn24
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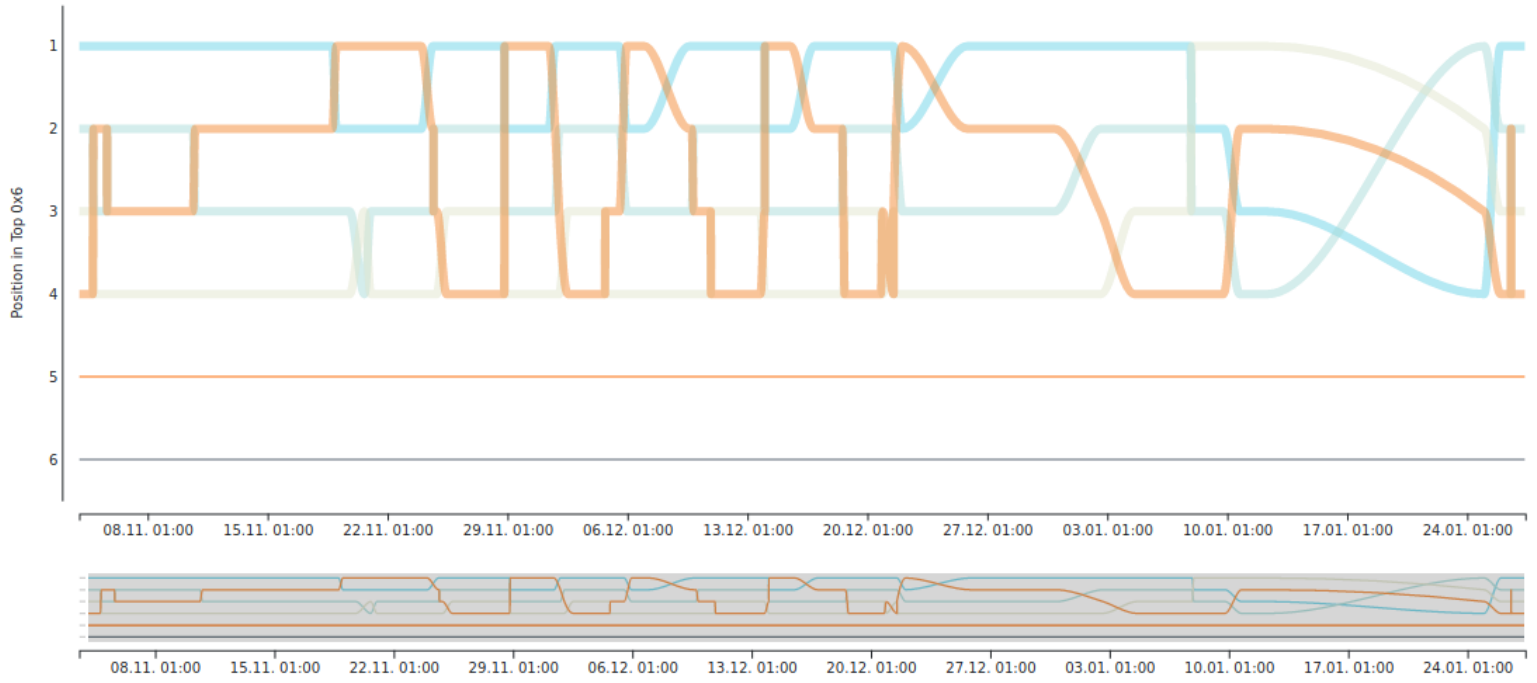
Graphs



Process — Phase I

- Teams of two
- Every week: Introduction to a new topic
  - Submission of solutions **before** the following week's meeting
  - Presentation of the solution during that meeting

Process — Phase II

Final project

- Development of a vulnerable application
- Creation of an exploit (ab)using the vulnerability/ies
- Presentation (about 20 minutes)
- Hack the other teams' applications ☺
- Create Write-Up(s) about other teams' applications
- Details follow when the time has come

Contents

- Analysis and debugging tools
- Hijacking the control flow
- Shellcode
- Format string vulnerabilities
- Stack- and heap-based buffer overflows
- Exploiting heap management logic
- Bypassing protection mechanisms

Don't say we didn't warn you

- Assume up to 30h of workload per week
- (But: You reach state-of-the-art ~~uber 1337 h4x0r skillz~~ knowledge about binary exploitation techniques on Linux systems)

Time and place

When? Tuesday, 14:00
Where? TBA

Registration

- Solve our qualification challenge **individually**!
  - Connect via netcat or in Python via socket module
  - GDB might be helpful
  - Dockerfile in case program behaves differently on your system
  - stderr will be helpful for debugging

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- Available at:

  `courses.sec.in.tum.de:39227`
- Registration `courses.sec.in.tum.de/bx`
- **Deadline**: 2024-02-19 (23:59 pm)
- Registration using the **matching system** (formally required)
- 20 slots - our priorization is **FCFS**

- Contact me at kilger@sec.in.tum.de

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Questions?