Binary Exploitation I — SS 2017

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)

Scores

#	Team	x1	x2	x3	s0	s1	s2	s3	s4	s5	s6	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Σ
1	team205	☑	☒	☒	☒	☑	☑	☒	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	93
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4	/bin/get_flag	☒	☒	☒	☒	☒	☒	☑	☑	☒	☒	☑	☒	☒	☑	☒	☑	☑	☑	☑	☑	☑	☑	☒	☑	☑	☑	☒	☑	☑	☑	☑	☑	☒	☑	☑	☑	63
5	-_-	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☒	☑	☒	☑	☒	☒	☑	☒	☒	☒	☒	☒	55
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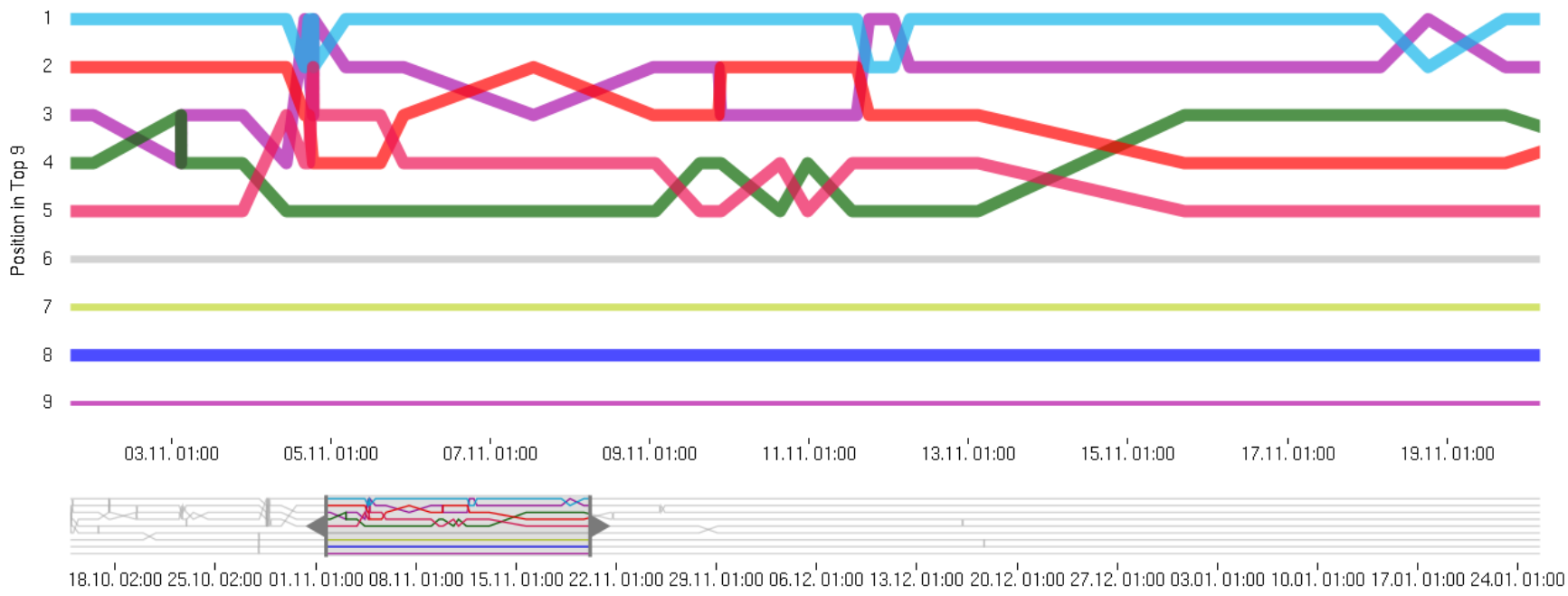
8	hunter2	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☑	☒	☒	☒	☒	☒	☒	☒	☒	☒	☑	☒	☒	☒	☒	☒	☒	☒	☒	☑	☑	☒	☒	☒	☒	☒	11
9	X0RX35	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☑	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	3

Graphs



Process — Phase I

- Teams of two
- Every week: Introduction to a new topic
  - Submission of solutions **before** the following week's meeting
  - Private explanation 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
- Hack the 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? Wednesday, 14:00
Where? 01.05.013

Registration

- Solve our qualification challenge!
- Available at:

  `kirschju.re:55555`
- Get the **binary** at `https://kirschju.re/static/vuln`
- Get the **source** at `https://kirschju.re/static/vuln.c`
- **Deadline**: February 3rd (11:59 pm)
- Details: See the course web page after the premeeting
- Registration using the **matching system** (formally required)
- 14 slots

- Contact us at {kirschju,jonischk}@sec.in.tum.de
- PGP fingerprints:
  - F949 CFBD 140A 6DD0 71E9 0B8C DC24 396B 6D45 1038
  - A903 76D1 65F3 25F9 8594 280A 2BA0 1592 EFAC B551

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Questions?