Securing the Linux Kernel - Security Features and Attack Vectors

Bachelor/Master Seminar SoSe 2020

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Fraunhofer AISEC

Securing the Linux Kernel

Topic Suggestions

- (Security Issues in) Hardware Virtualization
- Privilege Escalation
- Isolation with Namespaces and Cgroups
- Sandboxing with seccomp
- Security Enhanced Linux (SELinux)
- AppArmor
- Full Disk Encryption
- Integrity Management Architecture using Secure Boot as an example
- Spectre
- Meltdown

Students are welcome to suggest own topics.

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Prerequisites

- IN0009 Grundlagen: Betriebssysteme und Systemsoftware
- IN0004 Einführung in die Rechnerarchitektur
- Preferable: IN2209 IT Sicherheit
- Interest in the Linux operating system and security topics

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Objectives

- Understand Linux Kernel security mechanisms and attack vectors.
- Preparing and writing a scientific paper in LaTeX (in English, 8-10 pages, LNCS).
- Presenting a scientific topic (in German/English): 30 minutes + 15 minutes discussion.
- Active participation.

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Grading

- Scientific paper: 40% (Content, Style, Effort, Grasp)
- Presentation: 40% (Content, Lecture Style, Understandability)
- Presentation Slides: 10% (Content, Style)
- Active participation: 10%

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Registration

- Send us an email with your top 3 desired topics.
- You can add a letter of motivation to emphasize your top choice.
- Register in the Matching system on time.
- We'll assign topics to students with your input.

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Time Table

28.01.	Preliminary meeting (today)
12.02	Deadline for registration in matching system and email with desired topics
03.03. 10:00-11:00	Kickoff meeting[1] with topic distribution
20.04.	Deadline for deregistration (afterwards: 5.0!)
04.05. 23:59	Deadline for submission of table of contents (ToC)
06.05. - 20.05.	Individual meetings[1] to discuss ToC
17.06. 23:59	Deadline for submission of paper
24.06. 23:59	Deadline for submission of presentation slides
01.07. 10:00-12:00	
02.07 13:00-16:00	Presentation meetings[1]
08.07. 10:00-12:00	(attendance compulsory!)
09.07 13:00-16:00	

[1] All seminar meetings will be held at Fraunhofer AISEC

Contact Information

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