

ECE 5984 Virtualization Technologies

General Course Presentation

Pierre Olivier

Outline

- 1) High-level course overview
- 2) The instructors
- 3) Course Website
- 4) Grading
- 5) Texts
- 6) Prerequisites
- 7) TA & Office hours info

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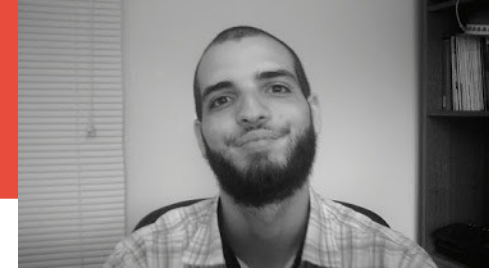
High-level course schedule

- **01/16 to 02/19: Introduction, Software & Lightweight virtualization**
 - ◆ Pierre Olivier
- **02/21 to 03/28: Hardware Support for Virtualization (Intel x86)**
 - ◆ Mohamed Karaoui
- **04/02 to 05/02: ARM virtualization, Storage virtualization, Cloud Computing**
 - ◆ Sang-Hoon Kim

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The instructors



- **Pierre Olivier, Mohamed Karaoui, Sang-Hoon Kim**

- ◆ Postdocs in the Systems Software Research Group

- <http://www.ssrgece.vt.edu>

- Offices:

- ◆ Durham 453 (Pierre & Sang-Hoon)
- ◆ Durham 454 (Mohamed)

- Emails addresses:

- ◆ Pierre: polivier@vt.edu
- ◆ Mohamed: karaoui@vt.edu
- ◆ Sang-Hoon: sanghoon@vt.edu



The instructors

Systems Software Research Group

- Virtualization-related projects we are working on:
 - ◆ **Popcorn Xen**
 - Virtualization environments with heterogeneous hardware
 - Scalability of virtualized environments on multi-/many-cores
 - Focus on **unikernels**
 - ◆ **Virtuous User Environment (VirtUE)**
 - Secure, cloud-deployed desktop environment
- Other OS related project:
 - ◆ **Popcorn Linux**
 - Rack-scale operating system in heterogeneous/homogeneous environments
 - <http://www.popcornlinux.org>
- Opportunities for Undergraduate Research/Independent Study, MS/PhD thesis



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Course website

- Managed through **Canvas**, 2 sections:
 - ◆ Blacksburg VT campus students
 - ◆ Remote students (WebEx)
- All united under a single course on canvas: **Virtualization Technologies:**
<https://canvas.vt.edu/courses/63785>
 - ◆ Please check ASAP that you can access it, otherwise send me an email
- **Check it out regularly, important things will be posted there:**
 - ◆ Syllabus, lecture slides, project assignments and grades
 - Slides will be updated as the semester goes
 - Videos: we'll do our best
 - Discussion thread for each assignment
 - Instructor & TA will check it out regularly
- **Email used for important notifications**

Course website

Webex info

- <https://canvas.vt.edu/courses/63785/pages/webex-course-access>
- Webex meeting number will change as we change the instructor
- From 01/17/2018 to 02/19/2018 (included):
 - ◆ 313 269 084 or <https://virginiatech.webex.com/meet/polivier>
- From 02/21/2018 to 03/28/2018 (included):
 - ◆ 646 117 599 or <https://virginiatech.webex.com/meet/karaoui>
- From 04/02/2018 to 05/02/2018 (included):
 - ◆ 645 400 148 or <https://virginiatech.webex.com/meet/sanghoon>

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Grading

Type of graded work	Percentage of final grade
Programming projects	90%
Final exam	10%

- **Projects** constitute most of the grade
 - ◆ 1 project per instructor, each one weighting for 30% of the final grade
 - ◆ Projects length: about a month for each one
- **Final exam:**
 - ◆ Multiple-choice quiz, take-home, open-book
 - ◆ Scheduled during exam week in May, you'll have 24 hours to complete it

- Problem with your grade? Let us (instructor/TA) know **within 2 weeks**
- Final exam grade issue? contact us **immediately** (we don't have 2 weeks to post the grades for this one)

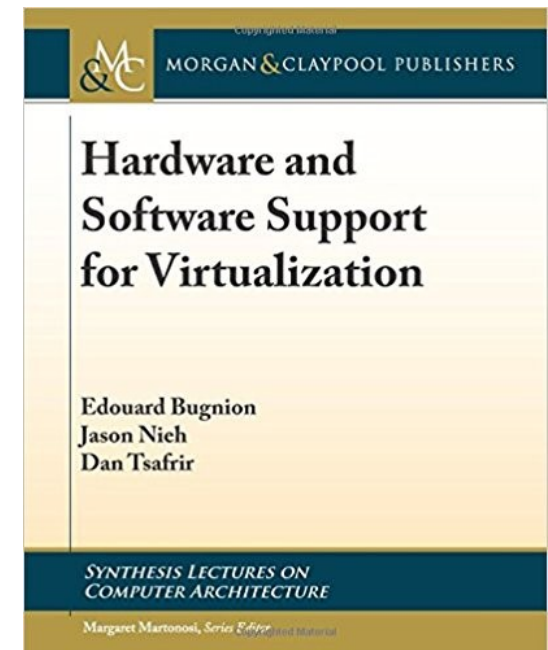
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Texts

■ Required textbook:

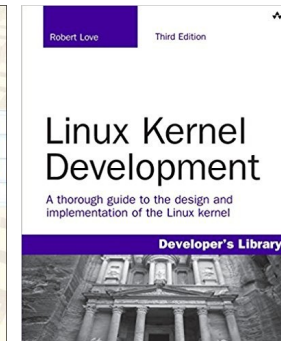
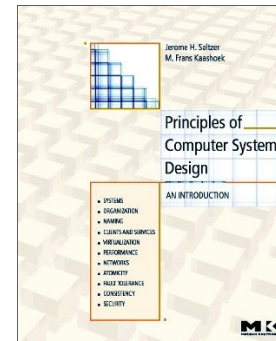
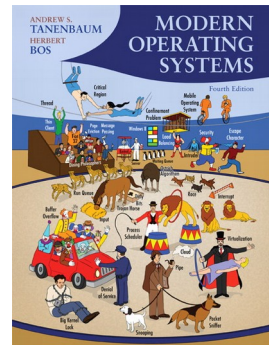
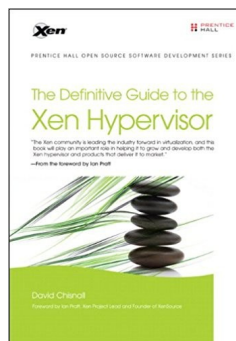
- ◆ Bugnion, Edouard, Jason Nieh, and Dan Tsafir. **"Hardware and Software Support for Virtualization."** *Synthesis Lectures on Computer Architecture* 12.1 (2017): 1-206.
 - ISBN-10: 1627056939
 - ISBN-13: 978-1627056939



Texts

■ Recommended books:

- ◆ Chisnall, David. **The definitive guide to the Xen hypervisor**. Pearson Education, 2008. ISBN-10: 013234971X.
- ◆ Tanenbaum, Andrew S., and Herbert Bos. **Modern operating systems**. Prentice Hall Press, 2014. ISBN-10: 013359162X.
- ◆ Saltzer, Jerome H., and M. Frans Kaashoek. **Principles of computer system design: an introduction**. Morgan Kaufmann, 2009. ISBN-10: 0123749573.
- ◆ Love, R. (2010). **Linux Kernel Development**, 3rd Edition. Addison-Wesley Professional. Pp. xxv, 440. ISBN-10: 0672329468



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Prerequisites

- Good knowledge of:
 - ◆ **Operating Systems concepts**
 - ◆ **Computer architecture**
 - ◆ **C programming**
 - ◆ Linux command line/no GUI environments
- Personal computer:
 - ◆ Should be able to **install Linux natively**
 - For example dual-boot
 - Have at least 40GB for the Linux partition
 - ◆ **Should have a CPU with virtualization hardware extensions**
 - All modern Intel/AMD CPUs will satisfy that constraint
 - Look on the syllabus for some links about how to check it
 - Contact me if this is an issue

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Office hours & TA

■ Teaching Assistant

- ◆ **Beichen Liu**, SSRG, bcliu430@vt.edu

■ Office hours

- ◆ *All office hours will be located in **Whittemore 344***
- ◆ Instructor office hours:
 - Tuesdays, 11AM to 12
- ◆ TA office hours:
 - Mondays, 9AM to 11AM
- ◆ Remote students: we can arrange Skype calls if needed, contact us
- ◆ Number of office hours can be scaled up according to the popularity