

Virtual Machines

Semester A. Tuesday, 14:00-16:00. Ornstein 110

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Schreiber 123A

<http://www.cs.tau.ac.il/~maon/>

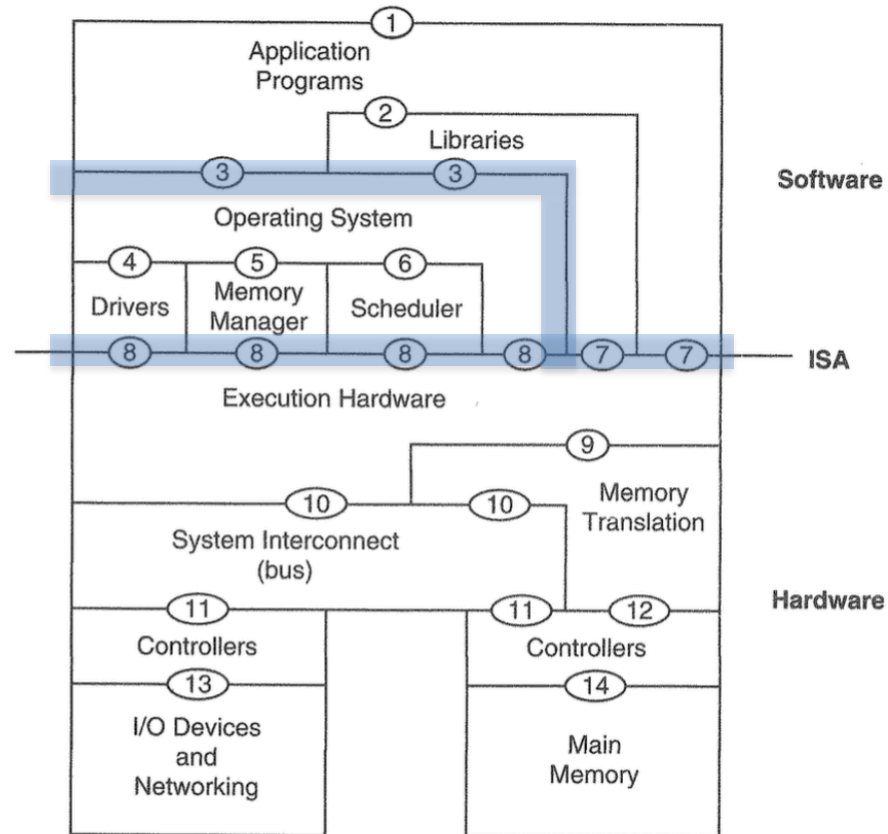
Virtual Machines

- Abstract hardware
 - Computers are complicated!
 - Key attack: abstraction
 - Interfaces encapsulate and hide implementation
 - E.g., Disk
 - » OS: Sectors, pages
 - » File system/application: Array of bytes
 - Our focus: Hardware/Software interface
 - E.g., IA-32 (aka x86)

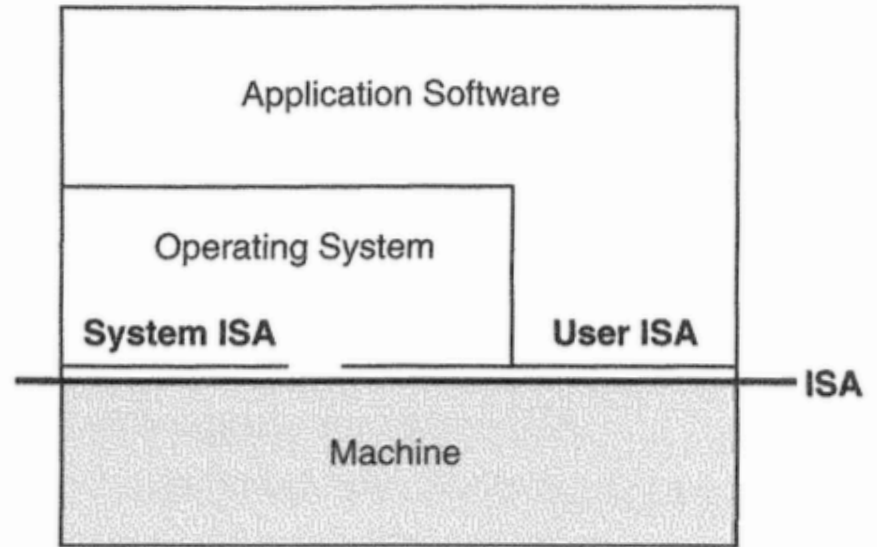
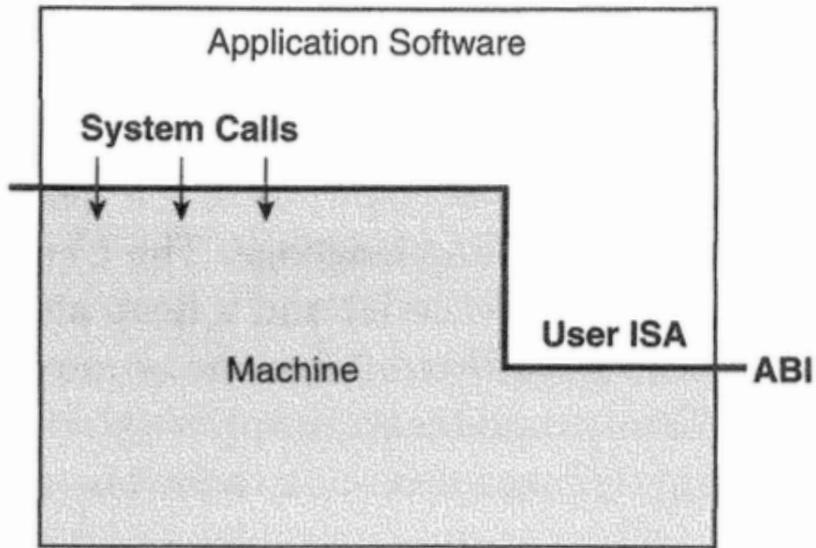
Virtualization

- Exposes interfaces of one system although the underlying system is different
 - Emulation: Real system → Host system
 - E.g., Vmware: running linux in Wondows
 - Or vice versa

Abstraction layers



Virtualization



Schedule

Lesson	Topic	Chapter
1	Overview	Chap.1
2	Introduction to VMs + Real Machines	Chap. 1
3	Emulation: Interpretation and Binary Translation	Chap. 2
4	Process Virtual Machines	Chap. 3
5	Dynamic Binary Optimization	Chap. 4
6	High-Level Language Virtual Machine Architecture	Chap. 5
7	High-Level Language Virtual Machine Implementation	Chap. 6
8	Codesigned Virtual Machines	Chap. 7
9	System Virtual Machines	Chap. 8
10	Multiprocessor Virtualization	Chap. 9
11	Emerging Applications	Chap. 10
12	AppSec: A Safe Execution Environment for Security Sensitive Applicationst	VEE'15
13	Deoptimization for Dynamic Language JITs on Typed, Stack-based Virtual Machines	VEE'14

Admin

Requirements

- You are required to be present in every lesson
 - unless coordinated ahead with the lecturer
- Meet me before lecture
 - Sunday 1600-1700, Schreiber 123A

Requirements

- Give a 70-80 minutes talk about his or hers assigned topic.
- Answer students questions during the talk.
- Say something original
- Lead a discussion a summary discussion.
- Write a short (1 page) summary
- Participate in the discussions

Grades

- 70% Presentation
- 5% Original insight
- 10% Participation
- 15% Attendance

Conclusions

- What was done
- Why is it important
- Novel idea
- What we learned

Your own conclusion

- Surprise me