

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination: Semester 1

Academic Year: 2015

Date: 12 December 2015

Time: 13.30 - 16.30 (3 hours)

Subject Number: 242-548

Room: A202

Subject Title: Cloud Computing Principles and Paradigms

Exam Duration: 3 hours

This paper has 15 pages, 4 questions and 165 marks (35%).

Authorised Materials:

- Writing instruments (e.g. pens, pencils).
- Textbooks, a notebook, handouts, and dictionaries are permitted.

Instructions to Students:

- Scan all the questions before answering so that you can manage your time better.
- Answers **must** be written in **Thai**.
- Write your name and ID on every page.
- Any unreadable parts will be considered wrong.

When drawing diagrams or coding, use good layout, and short comments; marks will not be deducted for minor syntax errors.

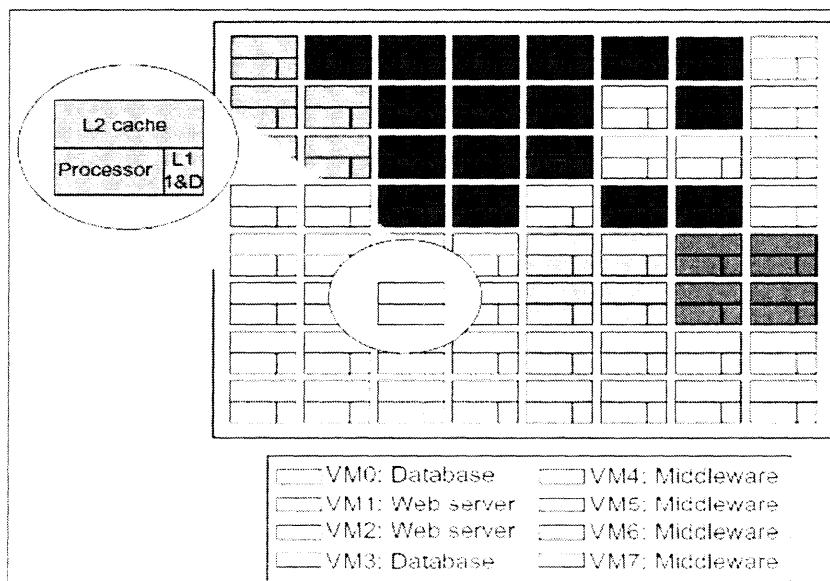
Cheating in this examination

Lowest punishment: Failed in this subject and courses dropped for two semesters.

Highest punishment: Expelled.

NO	Time (Min)	Marks	Collected	NO	Time (Min)	Marks	Collected
1	90	87		3	15	15	
2	60	50		4	15	13	
Total	180	165	Collected:		35%		

- 6) _____ In Memory Virtualization, the guest OS can directly access the actual machine memory.
 - 7) _____ I/O virtualization involves managing the routing of I/O requests between virtual devices and the shared physical hardware.
 - 8) _____ In full I/O virtualization, software device emulation runs much faster than the hardware it emulates.
 - 9) _____ Copy-on-write in I/O virtualization induces disk space consumption.
 - 10) _____ Para-I/O-virtualization achieves better device performance than full device emulation and it can achieve close-to-native performance.
 - 11) _____ Direct I/O virtualization lets the VM access devices directly but it comes with a higher CPU overhead.
 - 12) _____ In Self-Virtualized I/O, it utilizes a multicore processor and defines one virtual interface (VIF) for every kind of virtualized I/O devices.
 - 13) _____ virtualized I/O devices include virtual network interfaces, virtual block devices (disk), virtual camera devices, and others.
 - 14) _____ CPU virtualization demands hardware-assisted traps of sensitive instructions by the hypervisor.
 - 15) _____ Memory virtualization demands special hardware support to help translate virtual address into physical address and machine memory.
 - 16) _____ I/O virtualization is the easiest one to realize.
- f) Use the following figures to explain and illustrate the concept of Virtual Hierarchy. (8 marks)



(a) Mapping of VMs into adjacent cores

c) What are the *design considerations* in Warehouse-Scale Computer (WSC). (5 marks)

d) Compare black box, white box and gray box testing. (6 marks)

e) Explain ACID properties for *Megastore Architecture*. (8 marks)

Question 4 Ubiquitous Clouds and the Internet of Things (13 marks; 15 minutes)

- a) What are the differences between active RFID and passive RFID? Comment on their advantages and limitations. (5 marks)

- b) The IoT differs from the traditional Internet in many ways. Identify their differences and describe their distinctions in connecting entities, infrastructure and networking, and application domains. (8 marks)

----End of Examination----

Pichaya Tandayya Lecturer