Reading 2

Before You Read

1. What is the purpose of a data center?

2. How would you improve sharing and utilization of computer systems?

3. What do you think of virtualized server systems?

4. How would you enhance workload management?
improve the amount of work to be done

Read

Hardware Virtualization

main idea

Cloud computing services are usually backed by large-scale data centers
supported
composed of thousands of computers. Such data centers are built to serve many users and host many disparate applications. For this purpose,
?
different
hardware virtualization can be considered as a perfect fit to overcome
control
most operational issues of data center building and maintenance.
support

main idea

The idea of virtualizing a computer system's resources, including processors, memory, and I/O devices, has been well established for decades, aiming at improving sharing and utilization of computer

systems. Hardware virtualization allows running multiple operating systems and software stacks a single physical platform. As depicted in Figure 1-2, a software layer, the virtual machine monitor (VMM), also called a hypervisor, mediates access to the physical hardware presenting to each guest operating system a virtual machine (VM), which is a set of virtual platform interfaces.

main idea

The advent of several innovative technologies - multi-core chips, paravirtualization, hardware-assisted virtualization, and live migration of VMs - has contributed to an increasing adoption of virtualization on server systems. Traditionally, perceived benefits were improvements on sharing and utilization, better manageability, and higher reliability. More recently, with the adoption of virtualization on a broad range of server and client systems, researchers and practitioners have been emphasizing three basic capabilities regarding management of workload in a virtualized system, namely isolation, consolidation, and migration.

main idea

Workload isolation is achieved since all program instructions are fully confined inside a VM, which leads to improvements in security. Better reliability is also achieved because software failures inside one VM do not

isolation: property that defines how and when changes by one operation become visible to others

consolidation: when server resources are shared among multiple users

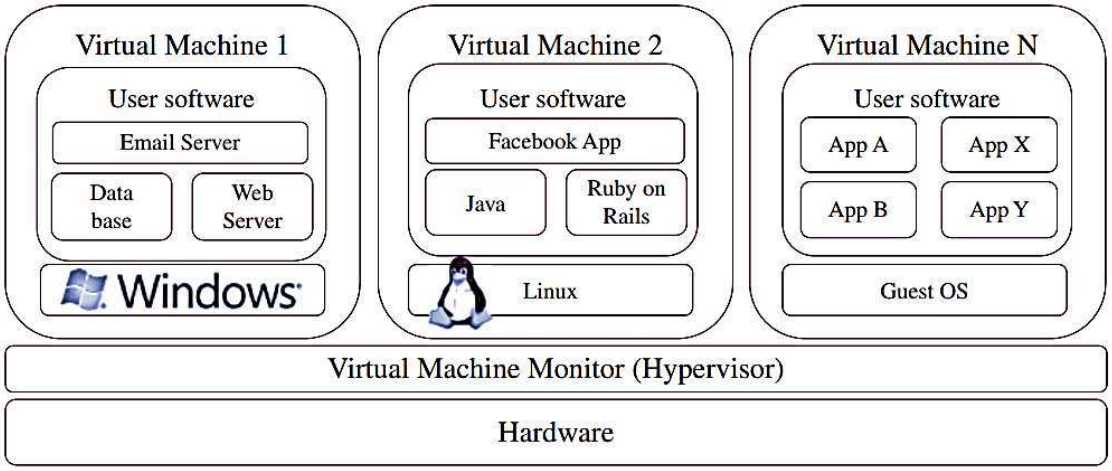
migration: moving from one platform or OS to another

affect others. Moreover, better performance control is attained since

achieve

execution of one VM should not affect the performance of another VM.

running



Ruby on Rails: a web framework written in Ruby programming language

FIGURE 1.2. A hardware virtualized server hosting three virtual machines, each one running distinct operating system and user level software stack.

different

main idea

The consolidation of several individual and heterogeneous workloads

diverse

onto a single physical platform leads to better system utilization. This practice is also employed for overcoming potential software and hardware incompatibilities in case of upgrades, given that it is possible to run legacy and new operation systems concurrently.

inability to be used in combination

only if; as long as

old

at the same time

main idea

Workload migration, also referred to as application mobility, targets at facilitating hardware maintenance, load balancing, and disaster recovery.

select as object of attention

resuming normal operations following a disaster

It is done by encapsulating a guest OS state within a VM and allowing it
confine
to be suspended, fully serialized, migrated to a different platform, and
cause to stop
resumed immediately or preserved to be restored at a later date. A VM's
start again
to return to a former condition
state includes a full disk or partition image, configuration files, and an
the division of sth
computer files containing parameters and definitions of an operating system
image of its RAM.

After You Read

Understanding the Text

A. Discuss these questions and give reasons for your answers. Then, compare answers around the class.

1. What is the impetus behind hardware virtualization?
driving force

2. Do you agree or disagree with hardware virtualization? Why?

3. How does the author support the idea of virtualizing computer system's resources?

B. Complete the chart. Then, share your answers with a partner.

	Isolation	Reasons
Capabilities regarding workload management in a virtualized system	1. Better security 2.Better reliability 3.Better performance control	- Fully confined inside a VM - Failures inside one VM don't affect others - Execution of one VM does not affect the performance of another YM
	Consolidation	Reasons
	1.	
	Migration	Reasons
	1.	

Building Vocabulary

A. The word virtualize is commonly used in technical texts. So, it is a good idea to know its family.

- An application combined with the environment needed to run it is referred to as virtual (**adjective**) appliance.
- We can virtualize (**verb**) the data center's resources and thus create a virtual cloud environment verb rather than a real one.
- Virtualization (**noun**) has revolutionized data center's technology through a set of techniques and noun tools that facilitate the providing and management of the dynamic data center's infrastructure.

Project. Write at least three more sentences using all family members of the word virtualize. You can get help from the text you read, the examples in the word magnifier box, or your dictionary.

Translation

The following text is about platform as a service. Firstly, discuss with your partner the uses of "as" in the text. Then, translate the text and see how they are translated into Persian.

In addition to infrastructure-oriented clouds that provide raw computing and storage services, another approach is to offer a higher level of abstraction to make a cloud easily programmable, known as Platform as