UNIVERSITY OF SCIENCE
FACULTY OF INFORMATION TECHNOLOGY

ASSIGNMENT 01.05

SUBJECT: OPERATING SYSTEM

Class: 21CLC03

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Contents

I. Differences between an operating system (OS) on a physical machine and an OS on a virtual machine (VM)

	OS on a physical machine	OS on a virtual machine
1. Hardware Access	An OS on a physical machine has direct access to the hardware resources of the machine (1)	An OS on a physical machine has direct access to the hardware resources of the machine (1)
2. Performance	An OS on a physical machine typically performs better than an OS on a VM because it does not have to go through a hypervisor to access hardware resources.	
3. Resource Allocation	An OS on a physical machine must share hardware resources with other applications on the same machine	An OS on a VM can be allocated dedicated hardware resources. (2)
4. Compatibility	An OS on a physical machine is generally more compatible with software and hardware than an OS on a VM	
5. Flexibility		An OS on a VM can be more easily configured and customized than an OS on a physical machine.
6. Isolation		An OS on a VM is isolated from the underlying physical system, so if the VM's OS becomes compromised, it does not affect the physical system. (2)
7. Security		An OS on a VM can provide a more secure environment for running potentially malicious applications. (2)
8. Maintenance	An OS on a physical machine requires more maintenance tasks than an	

	OS on a VM, such as installing security software, upgrading hardware, and backing up data.	
9. Cost	An OS on a physical machine may be more expensive to purchase and install	an OS on a VM can be installed on the same computer without the need for additional hardware.
10. Scalability	an OS on a physical machine may require hardware upgrades to scale up (3)	An OS on a VM can be easily scaled up or down by adding or removing resources
11. Portability	An OS on a VM can be easily moved to another physical machine or cloud environment	an OS on a physical machine is tied to that specific machine
12. Virtualization Overhead		Running an OS on a VM incurs overhead from the hypervisor, which can impact performance and resource usage. (2)
13. Host Dependencies		An OS on a VM may depend on certain features or configurations of the host machine, which can limit its portability or compatibility with other host machines.
14. Network Configuration	An OS on a physical machine may already have network connectivity	An OS on a VM may require additional network configuration to connect to external networks (4)

II. References

(1): https://www.geeksforgeeks.org/difference-between-host-and-guest-operating-system/

(2): https://www.techtarget.com/searchitoperations/definition/virtual-machine-VM

(3): https://www.nakivo.com/blog/physical-servers-vs-virtual-machines-key-differences-similarities/

(4): https://stuff.mit.edu/afs/sipb/project/vmdialup/archive/i386_linux24.old/lib/vmware-console/help/esx/networking_custom.htm