Module 2 Virtualization and Cloud Basic

TASK 2.1

1. Які найпопулярніші гіпервізори використовуються для віртуалізації інфраструктури.

**Microsoft Hyper-V** (codenamed Viridian) formerly known as Windows Server Virtualization. It is a native hypervisor. It can create virtual machines on x86-64 systems running Windows. Starting with Windows 8, Hyper-V superseded Windows Virtual PC as the hardware virtualization component of the client editions of Windows NT (**Windows NT** is a family of operating systems produced by Microsoft, the first version of which was released on July 27, 1993. It is a processor-independent, multiprocessing and multi-user operating system.).

**VMware Workstation Pro** is a hosted hypervisor that runs on x64 versions of Windows and Linux operating systems (an x86 version of earlier releases was available). Each virtual machine can execute its own operating system, including versions of Microsoft Windows, Linux, BSD, and MS-DOS. VMware Workstation is developed and sold by VMware, Inc., a division of Dell Technologies.

**Xen** is a type-1 hypervisor. It was originally developed by the University of Cambridge Computer Laboratory and is now being developed by the Linux Foundation with support from Intel.

**Oracle VM VirtualBox** (formerly **Sun VirtualBox**, **Sun xVM VirtualBox** and **Innotek VirtualBox**) is a free and open-source hosted hypervisor for x86 virtualization, developed by Oracle Corporation. Created by Innotek, it was acquired by Sun Microsystems in 2008, which was in turn acquired by Oracle in 2010. VirtualBox may be installed on Windows, macOS, Linux, Solaris and OpenSolaris.

Parallels Desktop for Mac**,** by Parallels, is software providing hardware virtualization for Macintosh computers with Intel processors.

**Parallels RAS** is application virtualization software produced by Parallels that allows Windows applications to be accessed via individual devices from a shared server or cloud system. Parallels RAS was first released in 2014 by 2X Software.

**QEMU** (short for **Quick EMUlator**) is a free and open-source emulator that performs hardware virtualization. QEMU is a hosted virtual machine monitor: it emulates the machine's processor through dynamic binary translation and provides a set of different hardware and device models for the machine, enabling it to run a variety of guest operating systems. It also can be used with KVM to run virtual machines at near-native speed (by taking advantage of hardware extensions such as Intel VT-x). QEMU can also do emulation for user-level processes, allowing applications compiled for one architecture to run on another.

2. Стисло опишіть основні відмінності найпопулярніших гіпервізорів.

Each of these services has differences in functionality, supported operating systems and types of hypervisors. The most important difference is the type of hypervisor. *Classification made according to open sources*.

**Standalone hypervisor (Type 1, X)**

There are built-in device drivers, models and a scheduler. Since an autonomous hypervisor works directly in the surrounding world, it becomes more productive, and also reproduces virtualization at the OS and paravirtualization level.

Examples: VMwareESX, Citrix Xen Server

**Founded on basic OS (Type 2, V)**

It is a component which work on the same ring as the basic OS (ring 0). The guest code can be executed directly on the physical processor, but access to input / output devices of the computer from the guest OS is through the second component, the usual process of the main OS is the user level monitor.

Examples: Microsoft Virtual PC, VMware Workstation, QEMU, Parallels, Virtual Box.

**Hybrid (Type 1+)**

A hybrid hypervisor consists of two parts: a thin hypervisor that controls the processor and memory, as well as a special service OS that runs under its control in a low-level ring. Through the service OS, guest OSs gain access to physical equipment.

Examples: Microsoft Virtual Server, Sun Logical Domains (Oracle), Xen, Citrix XenServer, Microsoft Hyper-V, VMware Workstation.

**Operating Systems**

**Microsoft Hyper-V:** versions ofWindows x86-64;

**VMware Workstation Pro**: versions of Microsoft Windows, Linux, BSD and MS-DOS;

**Oracle VM VirtualBox:** versions of Microsoft Windows, Linux, BSD, MS-DOS, OS/2, Solaris and Open Solaris;

**Parallels RAS:** versions of Microsoft Windows;

**QEMU:** versions of Microsoft Windows, Linux, BSD, Solaris and MS-DOS.

Sources

<https://ru.wikipedia.org/wiki/%D0%93%D0%B8%D0%BF%D0%B5%D1%80%D0%B2%D0%B8%D0%B7%D0%BE%D1%80>

<https://en.wikipedia.org/wiki/QEMU>

<https://www.qemu.org/>

<https://www.parallels.com/ru/>

<https://en.wikipedia.org/wiki/Parallels_RAS>

<https://xenproject.org/>

<https://en.wikipedia.org/wiki/Xen>

<https://en.wikipedia.org/wiki/VMware_Workstation>

<https://www.vmware.com/products/workstation-pro/workstation-pro-evaluation.html>

<https://en.wikipedia.org/wiki/Hyper-V>

<https://docs.microsoft.com/en-us/virtualization/hyper-v-on-windows/quick-start/enable-hyper-v>

<https://en.wikipedia.org/wiki/Windows_NT>

<https://www.virtualbox.org/>

<https://ru.wikipedia.org/wiki/Oracle>

<https://en.wikipedia.org/wiki/VirtualBox>