EPAM University Programs

DevOps external course

Module 2 Virtualization and Cloud Basic

1. Які найпопулярніші гіпервізори використовуються для віртуалізації інфраструктури.

According to the report of the research and advisory company Gartner for x86 Server Virtualization Infrastructure(which Magic Quadrant was kindly provided in the lecture presentation) obvious leaders of the market are VMware and Microsoft.

Since each of these companies has their own developed and supported hypervisor, we can affirm, that the most popular hypervisors are VMware ESXi and Hyper-V accordingly.

But we should not forget, that Magic Quadrants are used to evaluate the commercial sales execution, vision, marketing and support of products within markets, which excludes evaluation of full open-source software (OSS). The x86 server virtualization infrastructure Magic Quadrant includes only commercial-vendor-based offerings, and it does not include individual positions and evaluations for OSS projects, such as Xen, KVM etc. Though, there are commercial versions of OSS that are evaluated in the report — Xen hypervisor is used by Citrix, OracleVM, KVM hypervisor is used by Huawei, Red Hat, Sangfor

Moreover, in the report we can find following statement: Amazon WebServices uses a variant of Xen. And let's keep in mind that this report was published on 2016. If we look for the up-to-date information, for today AWS' EC2 hypervisor is based on core KVM technology . Their competitor on the Cloud Services market - Google Cloud uses the open-source KVM hypervisor too.

But we are moving aside from Server Virtualization Infrastructure. Nevertheless, the above show us that Xen and KVM hypervisor are chasing such leader as Hyper-V and VMware ESXi, and become more popular among Virtual Server Providers.

2. Стисло опишіть основні відмінності найпопулярніших гіпервізорів.

As we highlighted above, the most popular hypervisor are VMware, Hyper-V, KVM, Xen.

VMware **ESXi** (formerly ESX) hypervisor belongs to type-1 (hypervisors run directly on the host's hardware to control the hardware and to manage guest operating systems.). It is a bare-metal hypervisor (installs directly onto on logic hardware without an intervening operating system).

Hyper-V is a native hypervisor (type-1), but has a different from ESXi architecture(micro-services). It implements isolation of virtual machines in terms of a partition, and there must be at least one parent partition in a hypervisor instance, running a supported version of Windows Server (a parent partition)

Kernel-based Virtual Machine (**KVM**) is a virtualization module in the Linux kernel that allows the kernel to function as a hypervisor. KVM provides hardware-assisted virtualization

Xen is a type-1 hybrid hypervisor(it runs directly on the host's hardware, but require a host OS)

VMware **ESXi** is distributed by proprietary license.

Hyper-V can be free downloaded, but has limitations(a command-line interface used to configure the host OS, physical hardware, and software).

KVM — by GPL version 2(free and open-source software).

Xen by GNU GPLv2 + licence (free and open-source software).

VMware ESXi is supported on x86, x86-64 CPU architecture.

Hyper-V — on x86-64 with Intel VT-x or AMD-V (as long as it is installed, third-party software cannot use VT-x or AMD-V. For instance, the Intel HAXM Android device emulator (used by Android Studio or Microsoft Visual Studio) cannot run while Hyper-V is installed.

KVM requires a processor with hardware virtualization extensions, such as Intel VT or AMD-V. KVM was originally designed for x86 processors and has since been ported to S/390, PowerPC, IA-64, and ARM.

Xen Project is currently available for the IA-32, x86-64 and ARM instruction sets