

# C2110 *UNIX and programming*

## Lesson 3 / Module 3

**PS / 2020 Distance form of teaching: Rev2**

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# Virtualization

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- **What is Virtualization**
- **Typical Use**
- **Overview of Hypervisors**
- **Installing Ubuntu OS into a Virtual Machine (VirtualBox)**

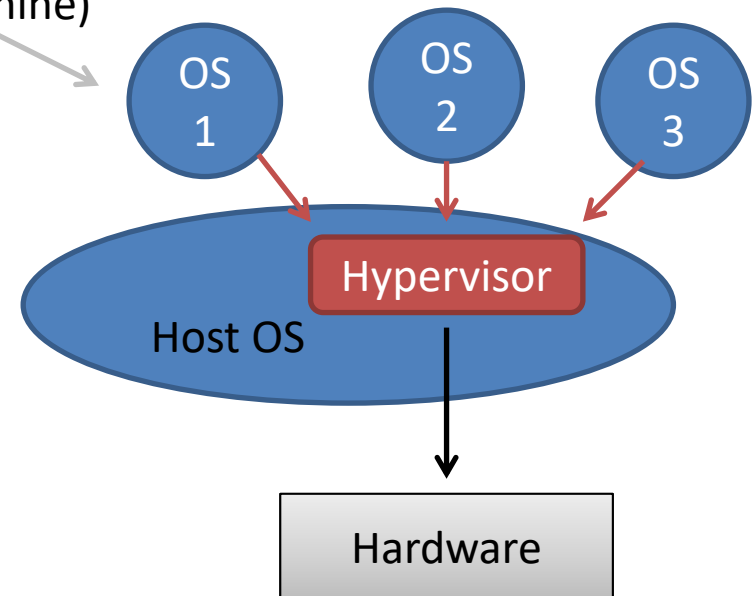
# Virtualization - Hypervisor

**Virtualization** are procedures and techniques that allow access to available resources in a different way than they physically exist. Virtualization can be done **on different levels**, from the whole computer (so-called **virtual machine**), its individual hardware components (e.g., virtual processors, virtual memory, etc.), or only the software environment (virtualization of operating system).

source: [www.wikipedia.org](http://www.wikipedia.org)

**Hypervisor** - virtual machine administrator

Guest OS (in a virtual machine)



# Advantages of Virtualization

- **More virtual machines** (each may have a different OS installed) on one physical machine.
- Physical hardware performance is better utilized (lower operating costs).
- Easier backup. The status of virtual machines can be recorded in the so-called **snapshots**, from which the virtual machine can be **restored**.
- **Teleportation**. Virtual machines can be transferred between two physical machines with a minimum downtime of the virtual machine. This is suitable for replacing defective hardware or its upgrade.
- **Easier testing** of OS.

# Overview of Virtualization Tools

## VirtualBox

[www.virtualbox.org](http://www.virtualbox.org)

Supported host OS: MS Windows, Mac OS X, Linux

License: freeware + proprietary extension for non-commercial use

## KVM

included in Linux kernel

Supported host OS: Linux

Support programs: virt-manager, qemu

License: freeware

## VMWare

[http:// www.vmware.com/](http://www.vmware.com/)

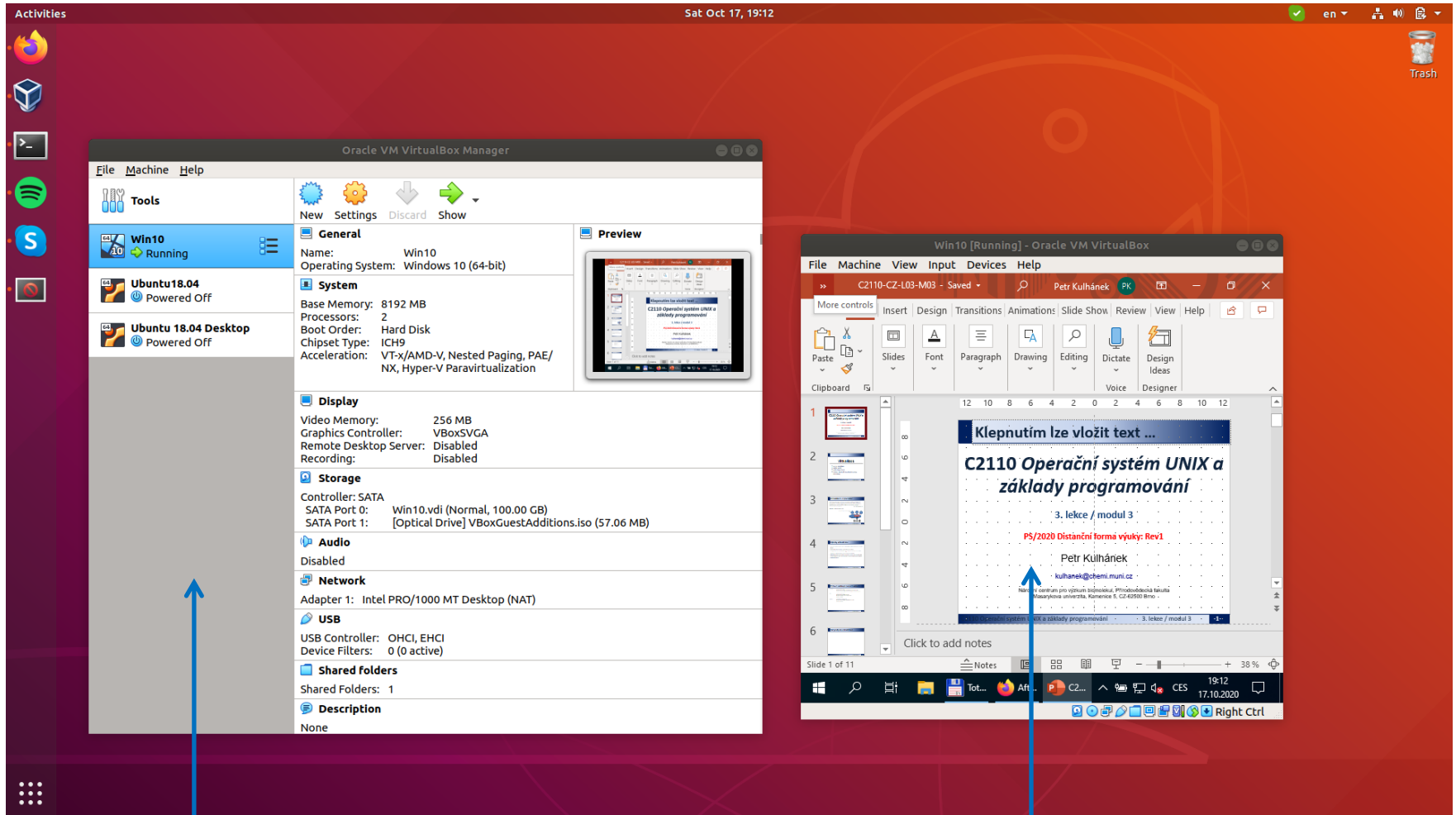
Supported host OS: MS Windows, Linux

License: commercial

## HW virtualization support

For efficient run of the virtual machine, the host CPU must contain virtualization instructions (Intel VT-x or AMD-v). This support must be enabled (setting in BIOS).

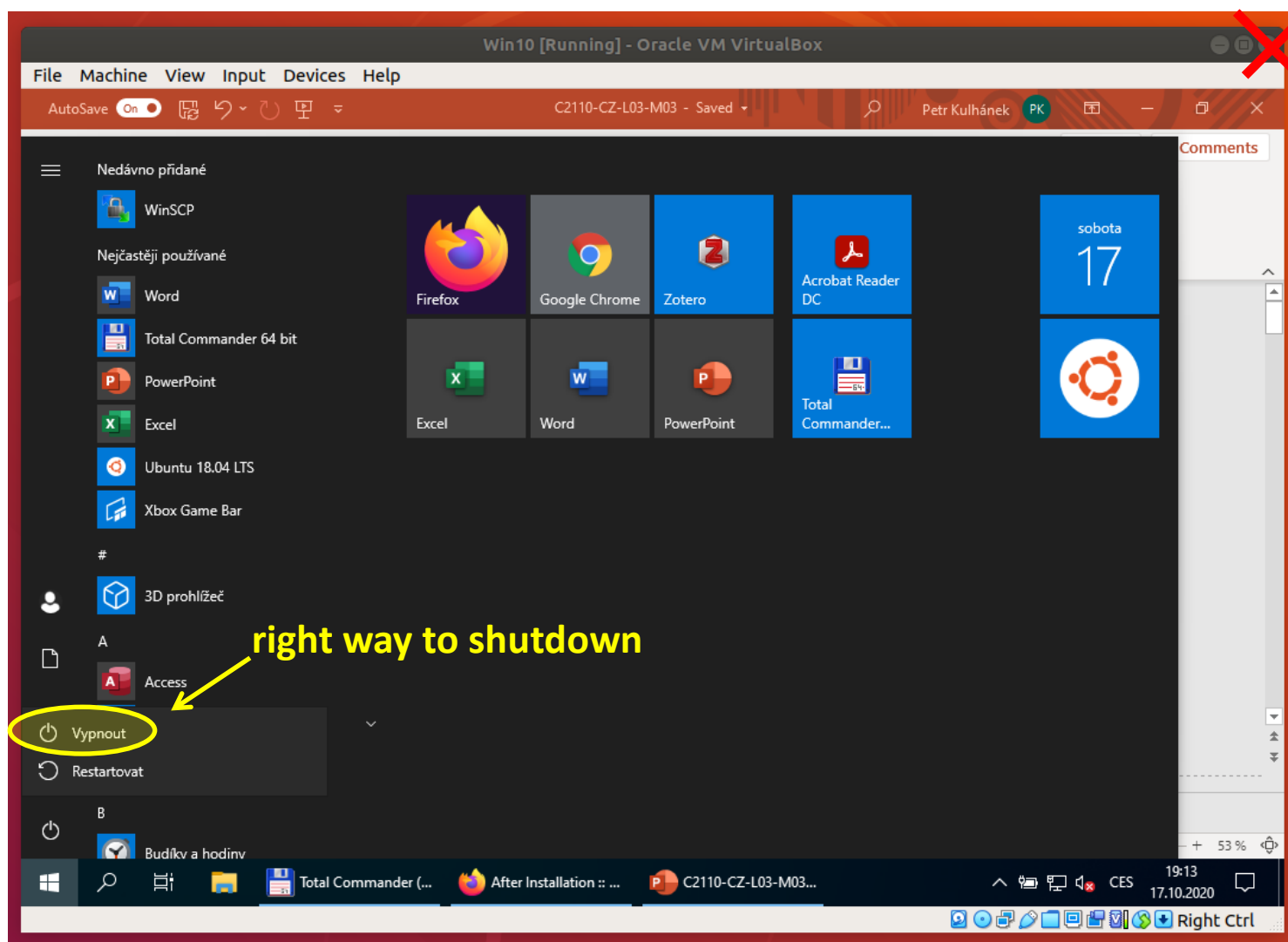
# Starting Virtual Machine



VirtualBox - Virtual machine administrator

virtual machine with MS Windows 10

# Shutting Down Virtual Machine

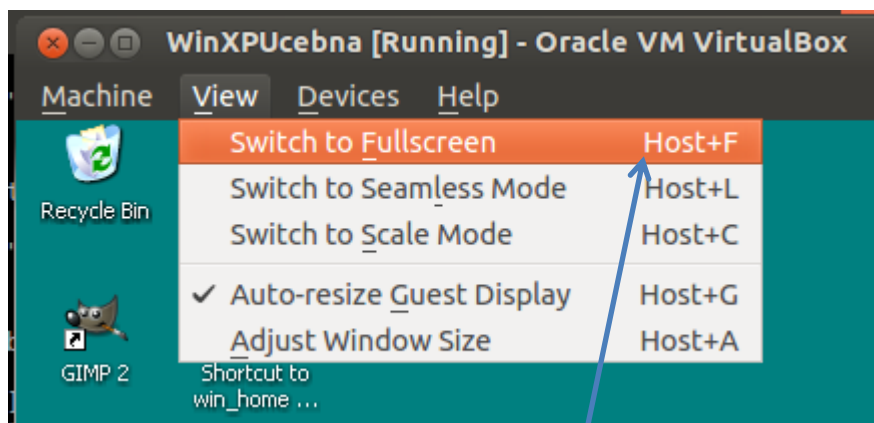


**wrong way to shutdown**

**right way to shutdown**

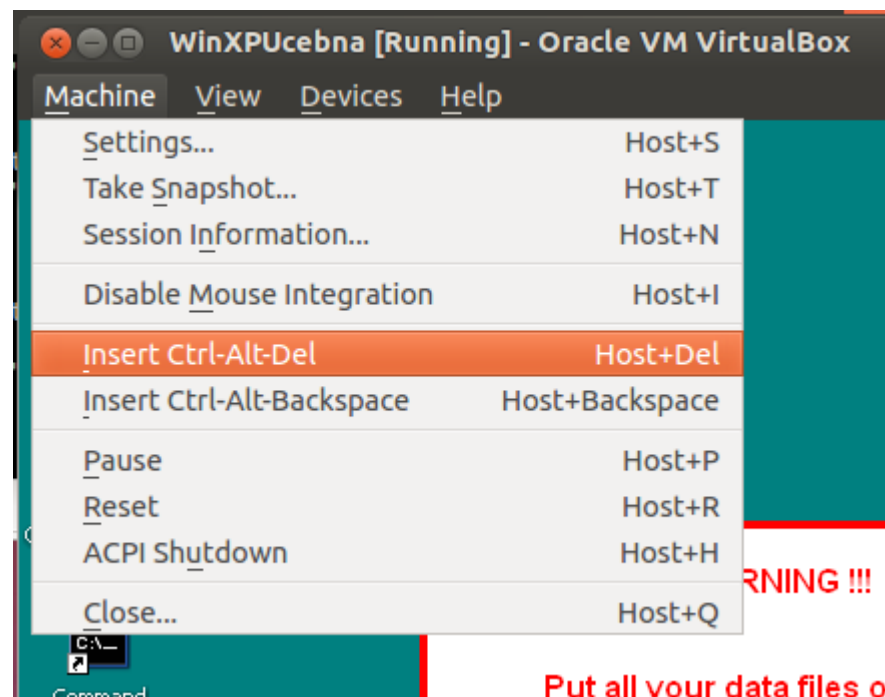
# Control of Virtual Machine

Switch to/from Fullscreen



**Host** = (right Ctrl key)  
(under MSWindows and Linux)

Press the Ctrl+Alt+Del keys





# Homework

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- **Installing Ubuntu 18.04 LTS**



# Installing Ubuntu 18.04 LTS

- Install the program VirtualBox ([http:// www.virtualbox.org](http://www.virtualbox.org)).
- Download the installation image for the Ubuntu OS in the form of an iso image.  
[http:// www.ubuntu.com/](http://www.ubuntu.com/)  
**Ubuntu 18.04 LTS (Ubuntu Desktop)**
- Create a virtual machine in VirtualBox manager  
choose the Linux OS and version Ubuntu  
the rest of the settings should be left at the default values
- Starting the virtual machine for the first time  
the first time you start the virtual machine, you will be asked to insert the installation media, we will insert the media into the virtual OS in the form iso image - file with extension .iso - (icon on the right and selection of the downloaded installation image)
- System installation  
after starting the installer from the installation media, follow the installation wizard