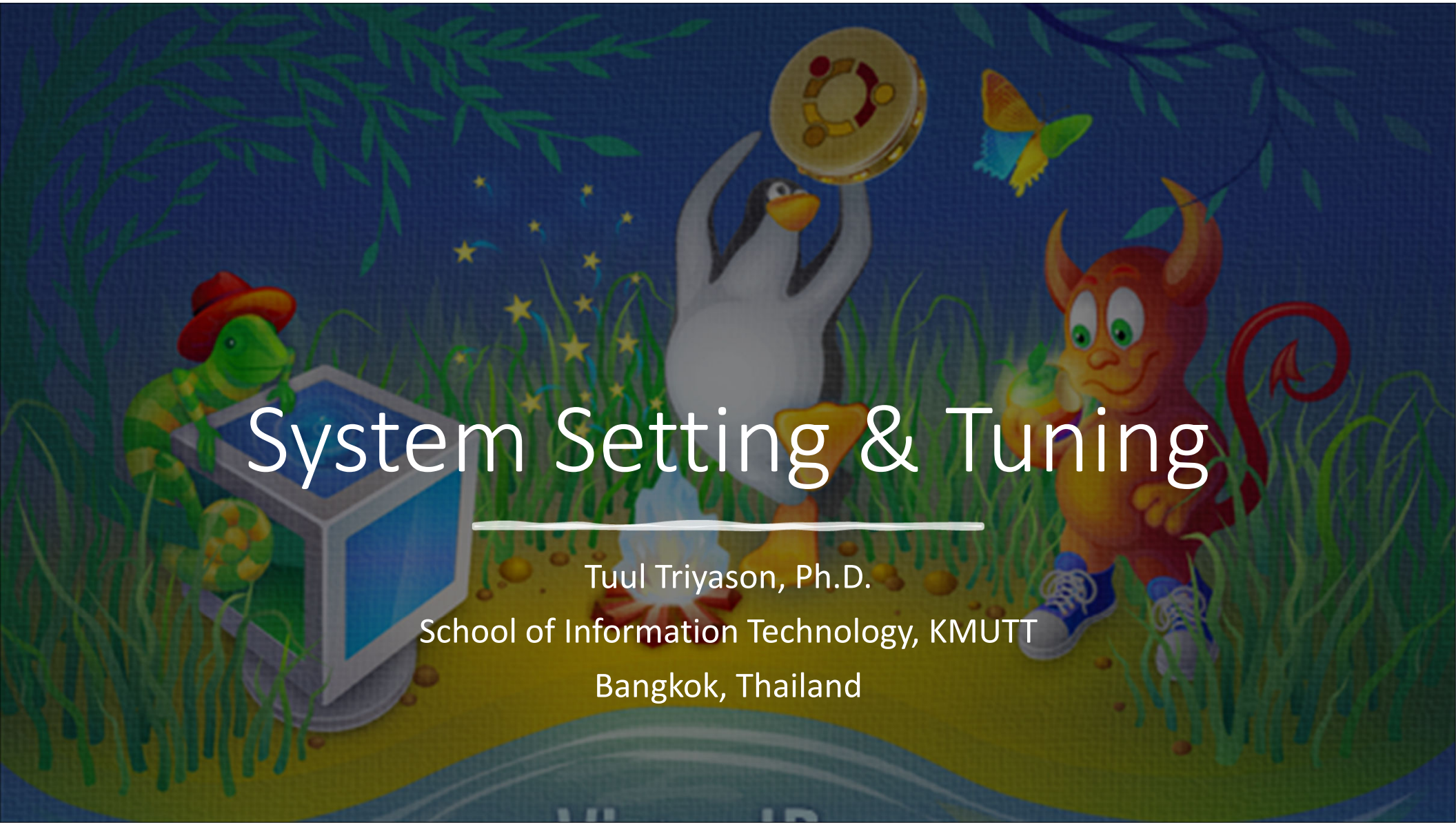

System Setting & Tuning

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General Settings

- Basic Tab
  - **Name:** The name of the VM, as shown in the list of VMs in the main Vbox Manager window. *If you change the name, Virtualbox renames these files as well.
  - **Type:** The type of the guest OS for the VM. Even though the default settings of a newly created VM depend on the selected OS type, changing the type later has on effect on VM settings.
  - **Version:** The version of the guest OS for the VM.

General Settings

- Advanced Tab
  - **Snapshot Folder**: By default, Vbox saves snapshot data together with your other Vbox configuration data. With this setting, you can specify any other folder for each VM.
  - **Shared Clipboard**: You can select here whether the clipboard of the guest OS should be shared with that of your host. If you select Bidirectional, then Vbox will always make sure that both clipboards contain the same data. If you select Host to Guest or Guest to Host, then Vbox will only ever copy clipboard in one direction.
  - **Drag and Drop**: This setting enables support for drag and drop. Select an object, such as a file, from the host or guest and directly copy or open it on the guest or host.

*Drag and Drop feature is disabled by default.

General Settings

- **Description Tab**: You can enter a description for your VM. This has no effect on the functionality of the machine, but you may find this space useful to note down things such as the configuration of a VM and the software that has been installed to it.
- **Disk Encryption Tab**: Enables you to encrypt disks that are attached to the VM. To enable disk encryption, select the Enable Disk Encryption check box.

System Settings

- Motherboard Tab
  - **Base Memory**: Sets the amount of RAM that is allocated and given to the VM where it is running.
  - Boot Order: Determines the order in which the guest OS will attempt to boot from the various boot devices.
  - **Chipset**: You can select which chipset will be presented to the VM. PIIX3 is the default for most guests. Vbox supports an emulation of the ICH9 chipset, which support PCI express, 3 PCI buses, PCI-to-PCI bridges and Message Signaled Interrupts (MSI). Using the ICH9 chipset is also possible to configure up to 36 network cards.
  - **TPM**: Enables support for a Trusted Platform Module (TPM) security processor.

System Settings

- Motherboard Tab
  - **Pointing Device:** The default virtual pointing device for some guest OS is the traditional PS/2 mouse.
  - **Enable I/O APIC**: Advanced Programmable Interrupt Controller (APICs) are an X86 hardware feature that have replaced Programmable Interrupt Controllers (PICs). With an I/O APIC, OS can use more than 16 interrupt requests.
  - **Hardware Clock in UTC time**: If selected, Vbox will report the system time in UTC format to the guest instead of the local (host) time.
  - **Enable EFI**: Enables Extensible Firmware Interface (EFI) which replaces the legacy BIOS and may be useful for certain advanced use cases.
  - **Enable Secure Boot**: Enables Secure Boot, to provide a secure environment for starting the guests OS.

Enable the I/O APIC is ***required***, especially for 64-bit Windows guest OS. It is also required if you want to use more than 1 virtual CPU in a virtual machine.

Processor Tab

- **Processors**: Sets the number of virtual CPU cores the guest OS can see. Vbox can present up to 32 virtual CPU cores to each virtual machine. (You should not configure VM to use more CPU cores than are available physically.)
- **Execution Cap**: This limit the amount of time a host CPU spends to emulate a virtual CPU. The default setting is 100% meaning that there is no limitation.
- **Enable PAE/NX**: PAE stands for Physical Address Extension. Normally if enabled and supported by the OS then even a 32 bit x86 CPU can access more than 4GB of RAM.
- **Enable Nested VT-x/AMD-V**: Enabled nested virtualization, with passthrough of hardware virtualization functions to the guest VM.

Acceleration Tab

- Paravirtualization Interface: Vbox provides paravirtualization interfaces to improve time-keeping accuracy and performance of guest OS.
- Hardware Virtualization:
  - Enable Nested Paging: If the host CPU support nested paging (AMD-V or Intel VT-x) features, then you can expect a significant performance increase by enabling nested paging in addition to hardware virtualization.

Display Settings

- Screen Tab
  - **Video Memory**: Sets the size of the memory provided by the vgpu available to the guest, in MB. Vbox Manager will show a warning if the amount of video memory is too small to be able to switch the VM into full screen mode.
  - **Monitor Count**: Vbox can provide more than one virtual monitor to a VM. Up to 8 vmonitors are supported.
  - **Scale Factor**: For multiple monitor displays, you can set the scale factor for individual monitors, or globally for all of the monitors. Use the slider to select a scaling factor up to 200%
  - **Enable 3D Acceleration**: If a virtual machine has Guest Additions installed, you can select here whether the guest should support accelerated 3D graphics.

Display Setting

- Graphics Controller
  - **VBoxSVGA**: The default graphics controller for new VMs that use Windows 7 or later. This gpu improves performance and 3D support when compared to the legacy VBoxVGA option.
  - **VBoxVGA**: Use this graphics controller for legacy guest OS. This is the default graphics controller for Windows versions before Windows 7 and 3D acceleration is not supported for this graphics controller.
  - **VMSVGA**: Use this graphics controller to emulate a Vmware SVGA graphics device. This is the default graphics controller for Linux guests.
  - None: Does not emulate a GPU.

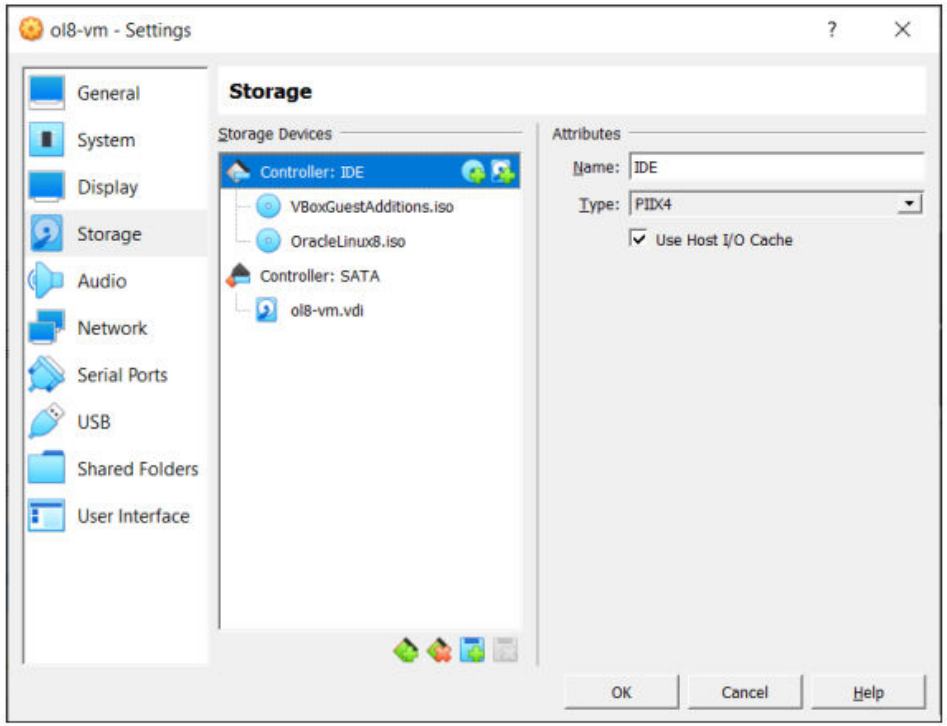
Remote Display Tab

- If Vbox Remote Display Extension (VRDE) is installed, you can enable the VRDP server that is built into Vbox.
- This enalbes you to connect to the console of the VM remotely with any standard RDP viewer.

Recording Tab

- On this tab you can enable video and audio recording for a VM and change related settings.
  - **Enable Recording**: Select this check box and select a **Recording Mode** option.
  - **Recording Mode**: You can choose to record video, audio or both video and audio. Some settings on the **Recording** tab may be grayed out, depending on the **Recording Mode** setting.
  - **File Path:** The file where the recording is saved.
  - **Frame size:** The video resolution of the recorded video in pixel.
  - **Frame rate:** Use the slider to set the max number of video frames/second (FPS)
  - **Video Quality:** Use the slider to set the bit rate of the video in kbps (increasing this value improves the appearance of the video at the cost of an increased file size).
  - **Audio Quality:** Use the slider to set the quality of the audio recording.
  - **Screens:** For a multiple monitor display, you can select which screens to record video from.

Storage Setting



Storage Settings

- **IDE controller**: A virtual CD/DVD drive is attached to device 0 on the secondary channel of the IDE controller.
- **SATA controller**. This is a modern type of storage controller for higher hard disk data throughput, to which the virtual hard disks are attached.
- If you created your VM with an older version of Vbox, the default storage layout may differ. You might see only have an IDE controller to which both the CD/DVD and the hard disks have been attached.

Audio Settings

- **Host Audio Driver**: The audio driver that Vbox uses on the host. The Default option is enabled by default for all new VMs. This option selects the best audio driver for the host platform automatically.
- **Audio Controller**: You can shoose between the emulation of an Intel AC’97 controller, and Intel HD Audio controller, or a SoundBlaster 16 card.
- **Enable Audio Output**: Enables audio output only for the VM.
- **Enable Audio Input**: Enables audio input only for the VM.

Network Settings

- When you first create a virtual machine, Oracle VM VirtualBox by default enables one virtual network card and selects the Network Address Translation (NAT) mode for it.
- This way the guest can connect to the outside world using the host's networking and the outside world can connect to services on the guest which you choose to make visible outside of the virtual machine.

USB Settings

- VBox can enable VMs to access the USB devices on your host directly. To achieve this, Vbox presents the guest OS with a virtual USB controller. As soon as the guest system starts using a USB device, it will appear as unavailable on the host.
- Be careful with USB devices that are currently in use on the host. For example, if you allow your guest to connect to your USB hard disk that is currently mounted on the host, when the guest is activated, it will be disconnected from the host without a proper shutdown. This may cause data loss.
- **USB Device Filter**: When USB support is enabled for a VM, you can determine in detail which devices will be automatically attached to the guest. For this you can create filters by specifying certain properties of the USB devices. USB devices with a matching filter will be automatically passed to the guest once they are attached.

User Interface

- **Menu Bar**: This widget enables you to disable a complete menu, by clicking on the menu name to deselect it. Menu entries can be disabled, by deselecting the check box next to the entry. On Window and Linux hosts, the complete menu bar can be disabled by deselecting the check box on the right.
- **Mini ToolBar**: In full screen or seamless mode, Vbox can display a small toolbar that contains some of the items that are normally available from the VM's menu bar. If you don't want to see the toolbar, disable the **Show in Full Screen/Seamless** setting.
- **Status Bar**: This widget enables you to disable and reorder icons on the status bar.

Alternative Firmware (EFI)

- By default, Vbox uses the BIOS firmware for virtual machines. To use EFI for a given VM, you can enable EFI in the machine's setting window. Alternatively, use the VBoxManage command line interface as follows:
- VBoxManage modifyvm "VM name" –firmware efi
- VBoxManage modifyvm "VM name" –firmware bios

Video Modes in EFI

- The default resolution is 1024x768. To select a graphics resolution for EFI, use the following VBoxManage command:
- *VBoxManage setextradata “VM name” VBoxInternal2/EfiGraphicsResolution HxV*
- *H* is the horizontal resolution and *V* is the vertical resolution.

VGA
640x480, 32bpp, 4:3

SVGA
800x600, 32bpp, 4:3

XGA
1024x768, 32bpp, 4:3

XGA+
1152x864, 32bpp, 4:3

HD
1280x720, 32bpp, 16:9

WXGA
1280x800, 32bpp, 16:10

SXGA
1280x1024, 32bpp, 5:4

SXGA+
1400x1050, 32bpp, 4:3

WXGA+
1440x900, 32bpp, 16:10

HD+
1600x900, 32bpp, 16:9

UXGA
1600x1200, 32bpp, 4:3

WSXGA+
1680x1050, 32bpp, 16:10

Full HD
1920x1080, 32bpp, 16:9

WUXGA
1920x1200, 32bpp, 16:10

DCI 2K
2048x1080, 32bpp, 19:10

Full HD+
2160x1440, 32bpp, 3:2

Unnamed
2304x1440, 32bpp, 16:10

QHD
2560x1440, 32bpp, 16:9

WQXGA
2560x1600, 32bpp, 16:10

QWXGA+
2880x1800, 32bpp, 16:10

QHD+
3200x1800, 32bpp, 16:9

WQSXGA
3200x2048, 32bpp, 16:10

4K UHD
3840x2160, 32bpp, 16:9

WQUXGA
3840x2400, 32bpp, 16:10

DCI 4K
4096x2160, 32bpp, 19:10

HXGA
4096x3072, 32bpp, 4:3

UHD+
5120x2880, 32bpp, 16:9

WHXGA
5120x3200, 32bpp, 16:10

WHSXGA
6400x4096, 32bpp, 16:10

HUXGA
6400x4800, 32bpp, 4:3

8K UHD2
7680x4320, 32bpp, 16:9

Specifying Boot Arguments

- VBoxInternal2/EfiBootArgs extradata can be passed to a VM in order to set the boot-args variable. To change the boot-args EFI variable, use the following command:
- *VBoxManage setextradata “VM name” VBoxInternal2/EfiBootArgs <value>*