Assignment No. 12

Aim

VMware workstation

Problem Definition

Create a VM depending on the user requirements.

Learning Objectives

- To learn the concept of virtual machine and virtual machine manager
- To learn how to install VMware workstation

Learning Outcome

- Understood concept of virtual machines and virtual machine manager
- Implemented the installation of VMware workstation

Software And Hardware Requirements

- Latest 64-BIT Version of Linux Operating System
- HyperV enabled in BIOS if supported by given system with Intel processor
- Modelio Software

Mathematical Model

Let S be the system of solution set for given problem statement such that,
S = { s, e, X, Y, F, DD, NDD, Su, Fu }
where,
s = start state
such that, y = { }
e = end state
such that, y = { VM }
where, VM = VM created
X = set of inputs

such that, X = { x1, x2, x3, x4 }
where, x1 = Allocated RAM
x2 = Allocated virtual HDD size
x3 = CPU threshold
x4 = Allocated Video Memory
Y = set of output
such that Y = { y1 }
where, y1 = VM created
F = set of function
such that F = { f1, f2, f3 }
where,
f1 = function to take requirements from user
f2 = function to create VM
f3 = function to start VM
DD = Deterministic data
such that, DD = { x1, x2, x3, x4 }
NDD = Nondeterministic data
such that, NDD = { y1 }
Su = Success case

- VMWare workstation is installed successfully in machine
- Machine has minimum hardware specification to run guest virtual machine

Fu = Failure case

- VMWare is not installed properly
- Machine hardware specifications below minimum required

State Diagram

Theory

Hypervisor

A hypervisor or virtual machine monitor (VMM) is a piece of computer software, firmware or hardware that creates and runs virtual machines.
There are two types of hypervisors:

- Type-1, native or bare-metal hypervisors:

  These hypervisors run directly on the host's hardware to control the hardware and to manage guest operating systems. For this reason, they are sometimes called bare metal hypervisors. A guest operating system runs as a process on the host.

- Type-2 or hosted hypervisors:

  These hypervisors run on a conventional operating system just as other computer programs do. Type-2 hypervisors abstract guest operating systems from the host operating system. VMware Workstation, VMware Player, VirtualBox and QEMU are examples of type-2 hypervisors.

VMware Workstation

VMware Workstation is a hosted hypervisor that runs on x64 versions of Windows, Linux Unix operating systems. It enables users to set up virtual machines (VMs) on a single physical machine, and use them simultaneously along with the actual machine. 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 EMC Corporation. An operating systems license is needed to use proprietary ones such as Windows. Ready-made Linux VMs set up for different purposes are available.

VMware Workstation supports bridging existing host network adapters and sharing physical disk drives and USB devices with a virtual machine. It can simulate disk drives; an ISO image file can be mounted as a virtual optical disc drive, and virtual hard disk drives are implemented as .vmdk files.

VMware Workstation Pro can save the state of a virtual machine (a "snapshot") at any instant. These snapshots can later be restored, effectively returning the virtual machine to the saved state, as it was and free from any post-snapshot damage to the VM.

VMware Workstation includes the ability to designate multiple virtual machines as a team which can then be powered on, powered off, suspended or resumed as a single object, useful for testing client-server environments.

VMware Workstation Architecture

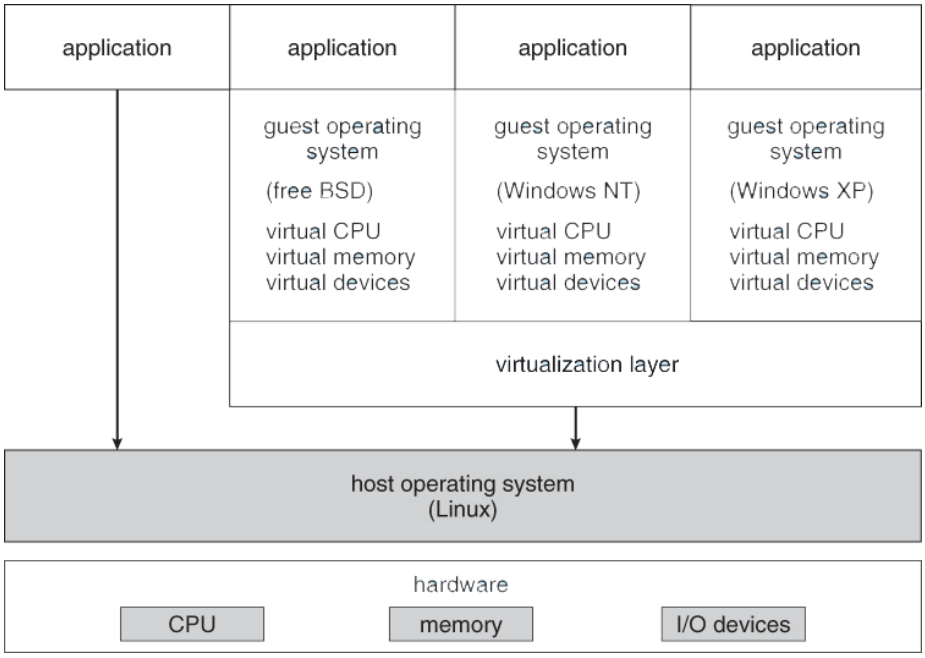


Fig : VMware Workstation Architecture

Output:

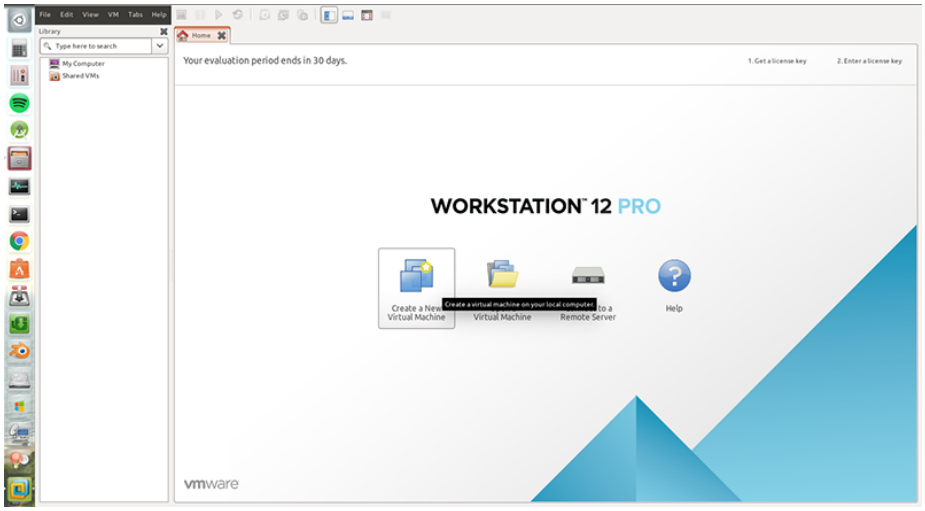


Fig : VMware Workstation

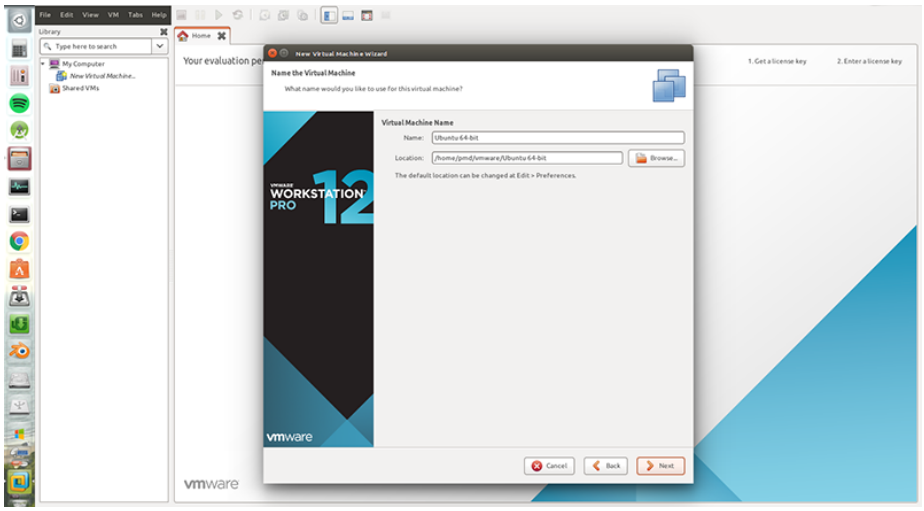


Fig : Creating New VM

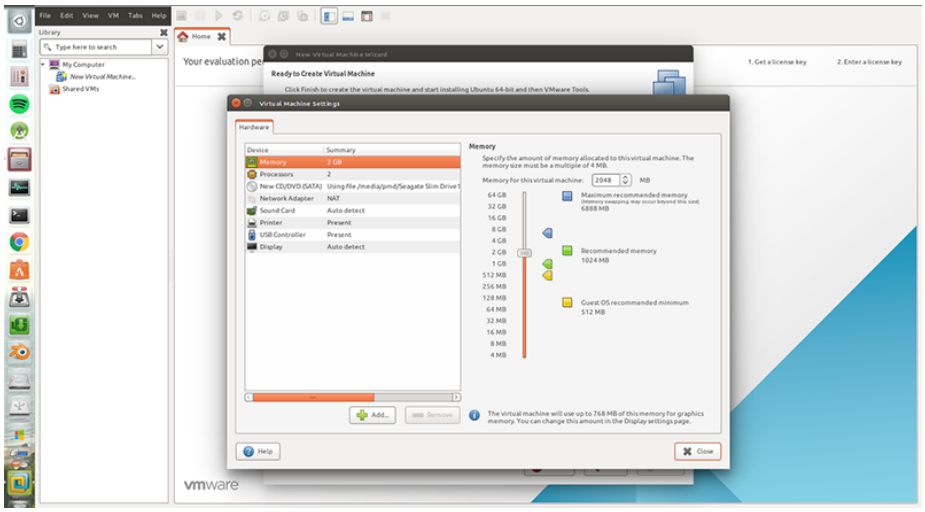


Fig : System Requirements for VM

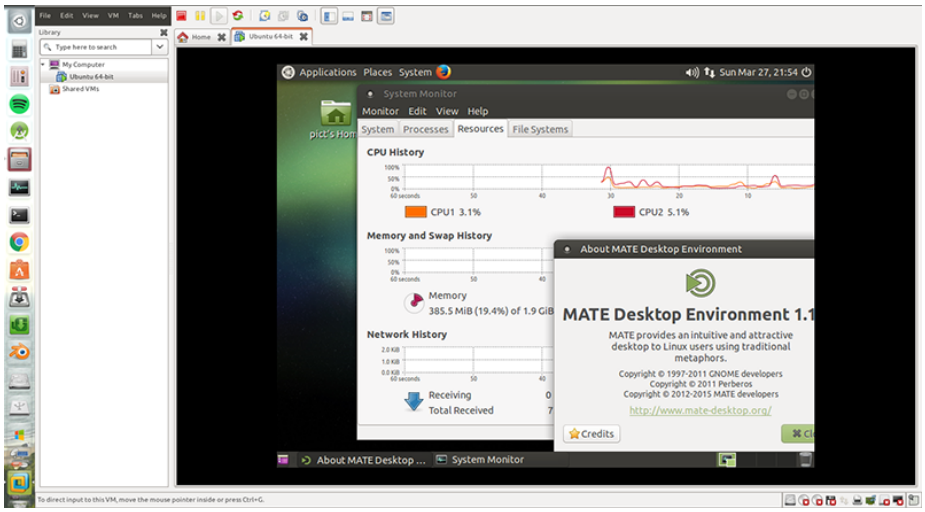
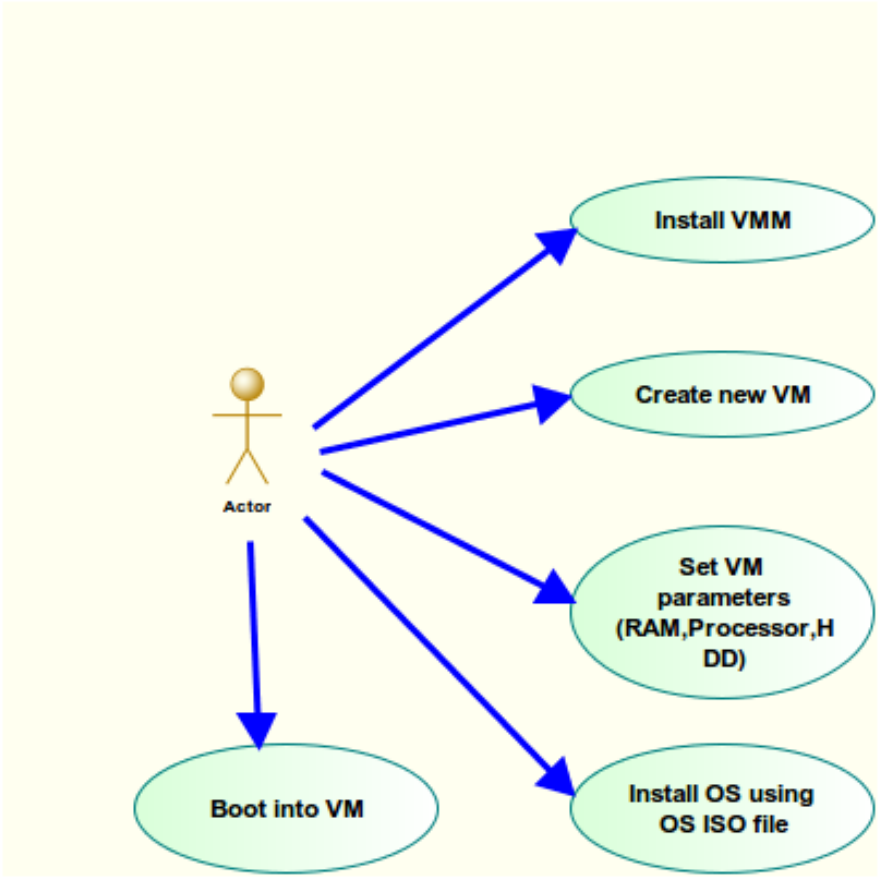


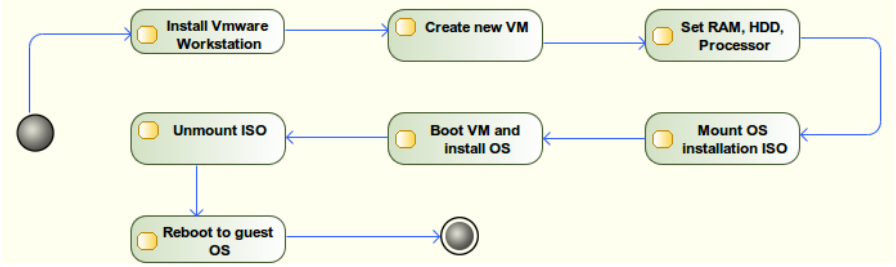
Fig : Newly Created VM

UML Diagrams

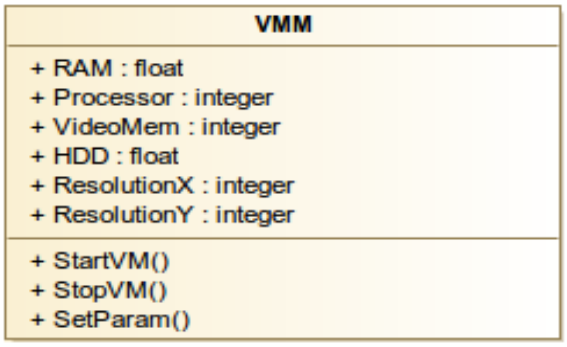
USE-CASE Diagram



Activity Diagram



Class Diagram



Conclusion

Thus, we understood the concepts of hypervisor and successfully implemented the Xen Hypervisor.