



Department of Computer Science and Business Systems

Academic Year 2024 – 2025 (Even Semester)

Degree, Semester & Branch: III Semester B.Tech. CSBE

Course Code & Title: CCS372 & Virtualization

Name of the Faculty member (s): Mrs.M.Jeya Sundari, AP/CSBE

Innovative Practice Description

- **Unit / Topic: Unit I / Para & Full Virtualization**
- **Course Outcome: CO1**
- **Topic Learning Outcome: TLO1**
- **Activity Chosen: Demonstration and Practice**
- **Justification:**

This method enables students to engage directly with virtualization technologies and observe their differences in real-time. Full virtualization, typically achieved using tools like KVM, emulates complete hardware environments, allowing unmodified guest operating systems to run independently. In contrast, para virtualization, as seen with Xen, requires modifications to the guest OS and offers better performance by interacting more directly with the hypervisor. Demonstrating these environments side-by-side gives students a visual and interactive understanding of each approach's architecture, setup process, performance implications, and use cases. This hands-on practice solidifies theoretical concepts and fosters deeper technical comprehension, critical thinking, and practical skill development essential for careers in system administration and cloud computing.

Time Allotted for the Activity: 40 Minutes

- **Details of the Implementation:**
 - A live demonstration was shown using virtualization tools like **KVM** for full virtualization and **Xen** for para virtualization. Students observed the installation, setup, and execution of virtual machines under both types.
 - The students were guided through the difference in system commands (e.g., virsh vs. xl), the structure of virtual machines, and how the guest OS interacts with the hypervisor in each case.
 - The students are asked to prepare a concept map by depicting the different concepts involved in Virtualization.
 - After the demonstration, students practiced the same on their own systems or in pairs using pre-configured lab environments.
 - They were then asked to **list the key differences** between Full and Para Virtualization based on their observations and explain real-world use cases for each.
 - This activity reinforced their understanding by bridging theory with actual system-level implementation, improving both conceptual clarity and technical skills.

- **CO – PO / PSO mapping:**

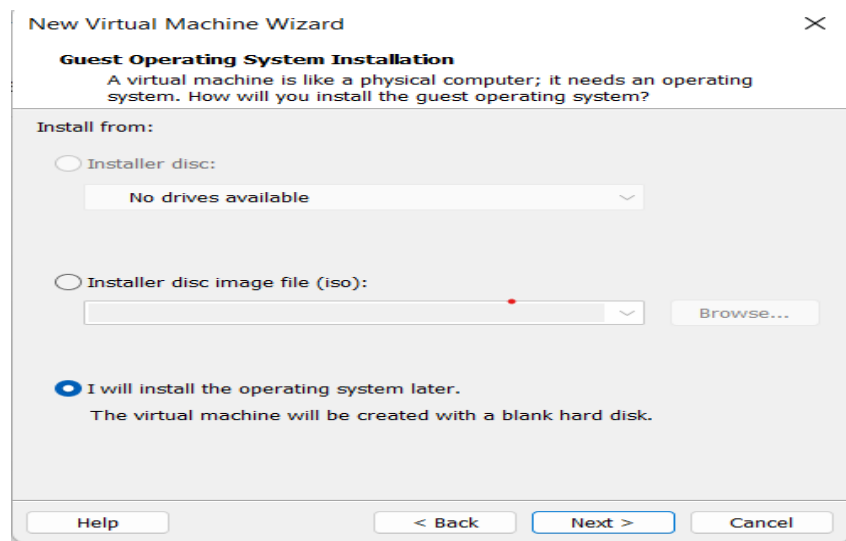
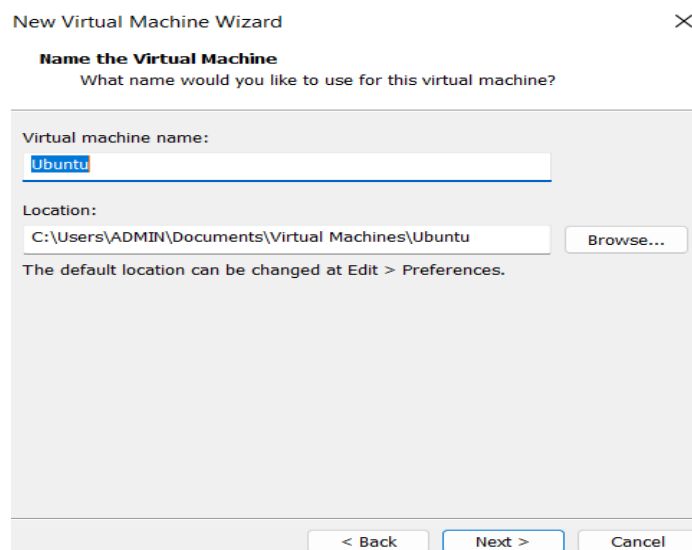
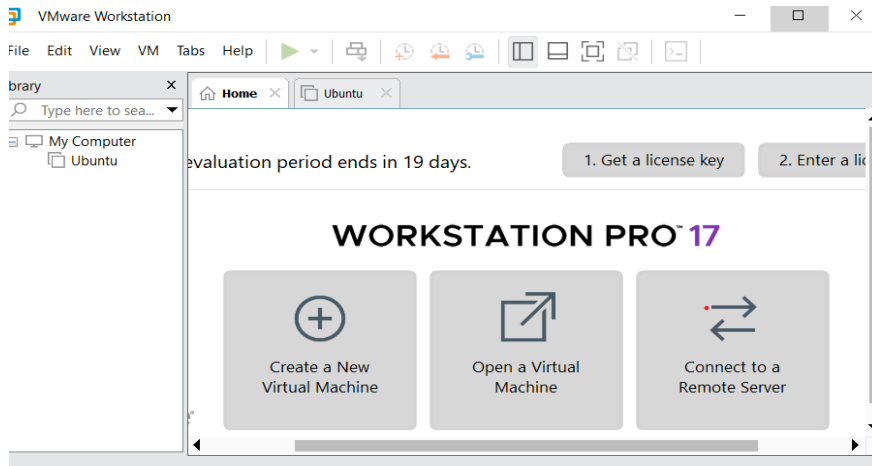
CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO3
CO6	2	2	2	2	3	2	2

(1 – Low 2 – Moderate 3 – High)

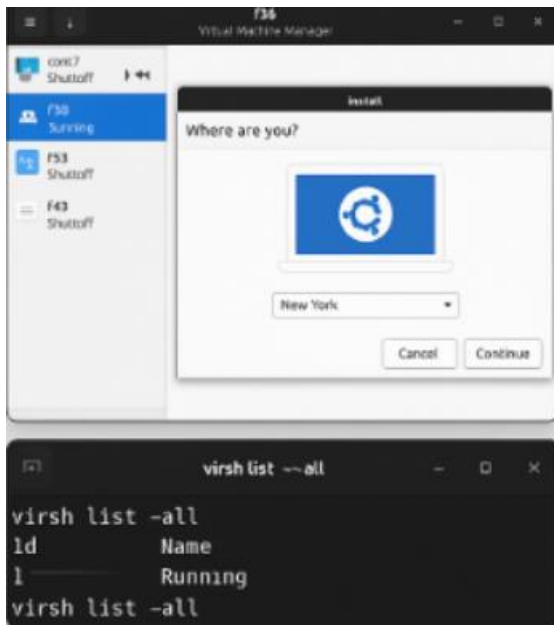
PO / PSO mapped:

Innovative practice	PO1	PO2	PO3	PO4	PO5	PSO2	PSO3
	2	2	2	2	3	2	2
Justification for correlation	Students will be able to understand the concept of Full and Para technology with Engineering Knowledge	Students will analyze Virtualization use cases and scenarios using engineering sciences.	Students will design and develop Virtualization-based solutions by implementing full and Para virtualizaiton.	Students will investigate complex problems related to Virtualization models and explore potential improvement	Students will effectively use Virtualization development tools and platforms to implement and gain hands-on experience in virtualization technology.	Students will be able to apply Virtualiztio n concepts to develop reliable IT solutions.	Students will be able to incorporate Virtualizati on with AI to provide solutions to real-world problems in Industry.

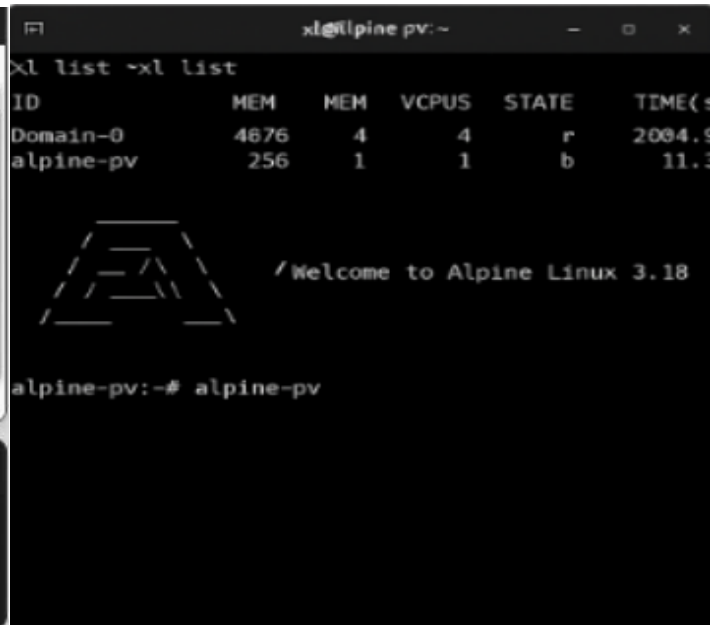
- **Images / Screenshot of the practice:**



KVM



XEN



Reflective Critique:

- Students know the possible online tools related to the subjects.
- The demo activity increases the student's presentation skills, knowledge and communication skills.
- Students get in-sight knowledge about the particular topics.

Benefit of the practice:

- The students enjoyed the activity.
- Hands-on practice aids in depth about concept clearly.
- Through practice, students develop the ability to apply their knowledge and skills to real-world challenges.

Challenges faced in implementation:

- Virtualization is designed as an online environment, and its integration with local development environments is limited. So, not able to

deploy in local environment.

References:

1. <https://andersbrownworth.com/virtualization/>
2. <https://www.teacheracademy.eu/blog/online-apps-tools-for-teaching/>
3. <https://www.european-agency.org/sites/default/files/itlresearch2011findings.pdf>

Signature of Faculty Member

HOD