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# Discuss the Application Research of Computer Virtual Reality Technology in College Student Management

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**Abstract.** With the development of technology, computer virtualization technology has been widely used in all walks of life, and it has greatly promoted the development of various industries. Of course, it also played a great role in promoting education and teaching management. This paper mainly analyzes the specific application of computer virtual technology in teaching management.

**Keywords:** Virtual Technology, Computer Teaching, Student Management

## 1. Introduction

Virtual technology runs through many technical fields. With the development of the information technology industry, the coverage of virtual technology is also expanding. Virtualization provides a common interface for a group of similar resources. It hides the difference between the attributes and operations of the hardware, and it uses resources in a common way.

## 2. Problems in existing computer teaching management

At present, the country is gradually increasing its attention to vocational education, and the scale of vocational education continues to expand. However, in the face of increasingly heavy teaching pressure, how to improve the school's running conditions and improve the teaching environment has become a stumbling block that hinders the development of vocational education and teaching. Especially for computer teaching, a computer laboratory may need to undertake multiple courses such as computer basics, computer software technology, and computer network applications. In order to maintain normal teaching, a computer may need multiple operating systems and multiple application software support, which creates huge difficulties for the installation and configuration of computer software and subsequent maintenance [1]. Especially when the laboratory undertakes courses such as computer network configuration or computer assembly maintenance, the laboratory teacher has already configured and maintained the computer equipment, but the students will change the computer configuration during the class. If the students cannot successfully complete the experimental teaching Tasks, or failure to restore the computer configuration state may affect the progress of other courses in the laboratory. However, if you restrict students from configuring and using computers because the laboratory undertakes more courses, it will also affect the effect of experimental teaching, and it is difficult for students to achieve the purpose of teaching due to various restrictions during the experiment [2].



### 3. Virtual Technology

#### 3.1. Significance of virtualization technology

Virtualization technology truly realizes the separation of software and hardware resources. Users do not need to consider how the specific hardware is implemented in the background, but only need to run their own systems and software in the virtual environment. The application of virtualization technology runs through all technical fields. It has penetrated into all levels of the IT field and is one of the indispensable key technologies for building cloud infrastructure.

#### 3.2. Types of virtualization

##### 1) Network virtualization.

Network virtualization includes virtual local area network and virtual private network. A virtual local area network (VLAN) divides a physical local area network into multiple virtual local area networks, and even divides the nodes in multiple physical local area networks into the same virtual local area network, making the communication of virtual local area network similar to the mode of physical local area network, which is transparent to users, Not easy to detect. The virtual private network (VPN) is abstracted as a network connection, allowing remote clients to securely access internal resources within the organization anytime and anywhere, just like accessing internal resources from the same local area network [3]. It is convenient for network administrators to manage the IT environment and can prevent Internet access. Or the attacks and threats of unrelated network segments in the Intranet, and at the same time, it can satisfy users to quickly and safely access applications and data.

##### 2) Storage virtualization.

Storage virtualization refers to an abstract performance for physical storage devices. Users access integrated storage resources through a unified logical interface in the abstract logical view. Storage virtualization is divided into two forms: storage virtualization of storage devices and network storage virtualization. Disk array technology (RAID) is one of the typical representatives of storage virtualization of storage devices. This technology combines multiple physical disks into The disk array uses inexpensive physical disks to achieve a high-performance fault-tolerant storage space, thereby achieving data security. Network area storage (NAS) and storage area network (SAN) are typical representatives of network storage virtualization technology [4].

##### 3) Server virtualization.

Server virtualization is the use of system virtualization technology on servers to virtualize a single server into several servers for users to use. Server virtualization is mainly the virtualization of three hardware resources: cpu, memory, equipment and I/O.

##### 4) Desktop virtualization.

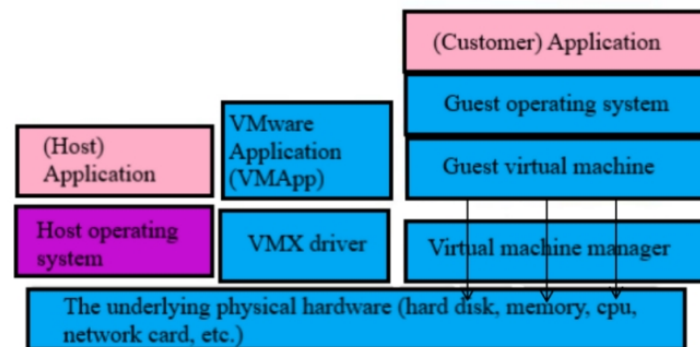
Desktop virtualization is the delivery of the user's desktop environment in the form of managed services, getting rid of the binding of traditionally used terminal devices, storing each user's personalized desktop environment on the server, and users can access the network through different terminal devices Access the desktop environment. Its greatest advantage is that it enables the software to configure PCs and other client devices from a centralized location. In addition, the user's personalized desktop environment is stored as a single independent virtual machine [5]. By performing snapshot and backup operations on the virtual machine, when a problem occurs, the desktop environment can be restored by quickly restoring the saved backup.

##### 5) Application virtualization.

Application virtualization is mainly aimed at applications, providing them with a virtual operating environment. In this environment, it mainly includes application executable files and the required operating environment. Application virtualization servers will provide users with all Program components are required to automatically push the application to the client. When the operation is completed, the data changed by the user will be synchronously uploaded to the server for centralized management. Users can use their own applications on different terminals.

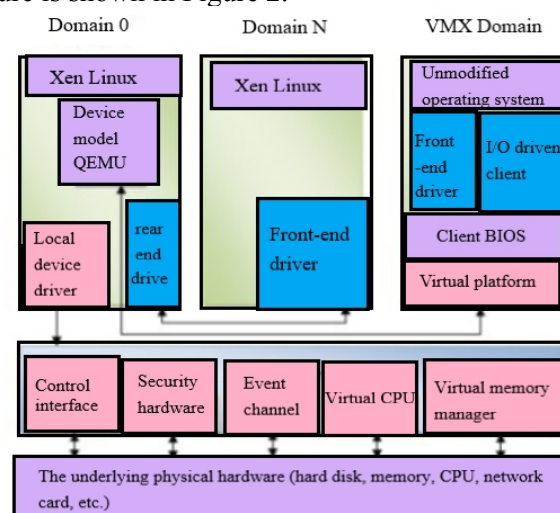
### 3.3. Typical virtual technology solutions

1) VMware VMware is the world's largest virtualization vendor and one of the mainstream vendors of X86 virtualization software. The company has 3 different levels of virtual machine software, including personal version of VMware Workstation, enterprise-level VMware GSX server and VMware ESX server. The virtualization technology they use is mainly full virtualization. With the addition of hardware-assisted virtualization, product performance has improved. VMware started early, and its products have the features of rich functions, easy configuration and use, and stability. The VMware workstation architecture is shown in Figure 1 [6].



**Figure 1.** VMware workstation architecture diagram

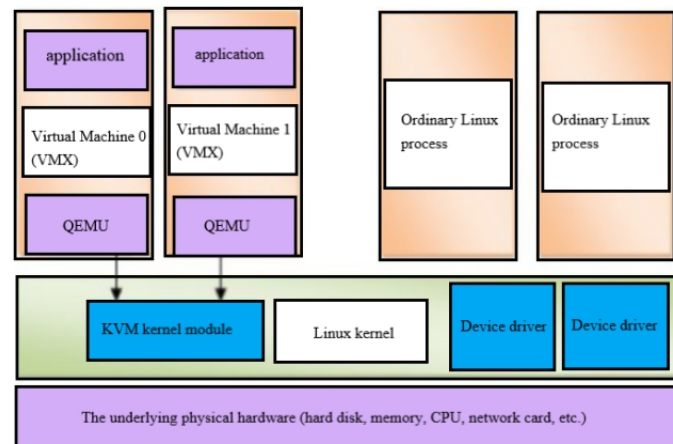
2) Xen Xen is an open source virtual machine software based on GPL authorization. It is a project developed by researchers from the University of Cambridge in the United Kingdom. It proposes a virtualization architecture that needs to modify the guest operating system. It can be used in X86, x86\_64, PowerPC and other CPUs. The architecture can provide powerful, efficient and secure virtualization features. Xen can support a wide range of client operating systems, including multiple release versions of Windows and Linux [7]. As an open source software, Xen has the characteristics of strong portability and unique virtualization support. From a technical point of view, Xen is based on a hybrid model. Its architecture is shown in Figure 2.



**Figure 2.** Xen architecture diagram

3) KVM Kvm is a full virtualization solution for Linux on the X86 platform. KVM is also an open source virtual machine software based on a general PL authorization method. Kvm was first developed by quumranet company. It is a leader in virtualization technology that has become a part of the traditional Linux kernel (V2. 6. 20). Based on the Linux system platform, a new concept of partition mechanism is proposed. It is characterized by the system kernel by adding kvm The kernel module

makes the system kernel itself a hypervisor (virtual machine management program). The architecture of Kvm is shown in Figure 3.



**Figure 3.** Architecture diagram of Kvm

#### 4. Application of virtual technology in teaching management

##### 4.1. Virtual operating system supports multi-course environment

At present, there are many virtual environments that can be well integrated, such as the RedhatLinux virtual system, which deploys multiple operating systems required for experimental courses on different virtual machines to start them. For each virtual machine, the physical host is running Independent subsystems, switching between different virtual machines can meet the needs of different courses for different operating systems [8]. In particular, using vmware to build a virtual local area network environment, students conduct network experiments through a virtual network environment. During the experiment, they don't have to worry about the failure of the experiment or the operation error of the computer to perform the teaching tasks of other courses.

##### 4.2. Support for using mobile devices

When students use the computer to run the teacher's teaching tasks but have not completed the prescribed courses, virtual technology can be used to store the virtual files deployed in the laboratory in the cloud disk or other mobile storage devices, and return to the class, bedroom or other In the laboratory, the virtual environment can be redeployed on a new computer, and the virtual machine can be started to continue to complete unfinished tasks. For each virtual machine, in its host computer, it is just a file, which can be easily moved. When teachers or students are required to demonstrate experimental results, it can also be deployed in the new host computer through virtual files. Demonstration was performed after the experiment, which relieved the restriction and dependence of the experiment on the environment.

##### 4.3. Introduction of Cloud Computing Technology

The current cloud computing technology is a research hotspot. In the traditional teaching process, teachers' teaching is limited by time and place. The current use of virtual space can establish a cloud-based online air teacher. Students can arrange their own learning according to their own time and learning habits. After the teacher has arranged the learning task, he can arrange a fixed time to answer questions and deploy the next learning task. Make teaching activities not confined to a certain teaching chapter at a certain time and place. With the rapid development of cloud computing technology, there are also a large number of high-quality and low-cost services in the current network. Building teaching service systems, library management systems, etc. , through the cloud platform can not only greatly reduce the capital investment in purchasing servers and the cost of server maintenance and

management, but also reduce server power consumption and computer room air conditioning power, thereby reducing the cost of higher vocational colleges The pressure of running a school [9].

### 5. Advantages of introducing virtual technology into computer teaching

At present, the introduction of virtual technology into computer teaching is mainly used in simulation training, scientific research, virtual learning environment, virtual laboratory and simulated virtual campus construction in the course of educational practice. At the same time, the application of virtual technology in education also requires a strong theoretical basis. The traditional learning environment has some difficulties in the transfer of learner's knowledge. Virtual technology just solves this point, and at the same time, constructivism is used as a powerful theory. The basis is to promote the improvement of the level of thinking in the education process, and the creation of the virtual environment is also crucial to the teaching design. At present, vocational education is gradually being valued by the state, but the traditional school-running is limited by space and funding, so many vocational colleges cannot cope with the teaching pressure caused by the expansion of student enrollment. Students cannot effectively improve their hands-on ability due to insufficient teaching resources such as equipment and venues [10]. The introduction of virtual technology into computer education will alleviate the problems of insufficient capital investment, insufficient experimental equipment, and huge workload of management personnel. It provides a convenient teaching environment for teachers and students, breaks the limitations of time and space, and effectively improves students' Practice hands-on skills.

### 6. Conclusion

In short, introducing virtual technology in teaching management has promoted the development of the education industry effectively. It not only changes the way of learning, but also improves the learning experience of students. At the same time, students also improved their learning ability. This makes the education management work more simplistic and more mature.

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