

CLOUD COMPUTING PRACTICAL 7

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Write-up:

Bare-Metal Hypervisors

A Bare-Metal Hypervisor is a type of hypervisor that installs directly on the physical hardware, acting as the primary operating system. It manages the hardware resources and virtualizes them for the virtual machines (VMs) running on top of it. Unlike hosted hypervisors, bare-metal hypervisors do not need a separate OS to function, making them highly efficient, secure, and stable for enterprise-grade applications.

Bare-Metal Hypervisors Type 0

Type 0 Bare-Metal Hypervisors, sometimes referred to as firmware hypervisors, are embedded directly into the server hardware. This type of hypervisor is common in large, high-performance systems such as mainframes. Due to their close integration with hardware, they offer extremely low overhead and high performance, but they are generally specialized and not widely used in commercial or consumer-grade environments.

Bare-Metal Hypervisors Type 1

Type 1 Bare-Metal Hypervisors, also known as native or bare-metal hypervisors, install directly on the physical hardware without the need for an underlying operating system. These hypervisors provide an isolated environment for virtual machines and are typically used in data centers and enterprise environments. Examples of Type 1 hypervisors include VMware ESXi, Microsoft Hyper-V, and Xen. Type 1 hypervisors are known for their stability, performance, and efficient use of system resources.

VMware

VMware is a popular virtualization platform that offers both bare-metal and hosted hypervisors. VMware's Type 1 hypervisor, ESXi, is widely used in enterprise environments for server virtualization, providing robust management tools, security features, and high performance. Additionally, VMware offers VMware Workstation, a Type 2 hosted hypervisor used for running virtual machines on a host operating system. VMware allows users to create and manage virtual environments efficiently and is compatible with various guest operating systems.

VirtualBox

VirtualBox is an open-source hosted hypervisor developed by Oracle, primarily used on desktops and laptops. As a Type 2 hypervisor, VirtualBox installs on top of an existing operating system, allowing users to run multiple guest operating systems concurrently. It supports a variety of host and guest systems, including Windows, Linux, and macOS. VirtualBox is known for its ease of use, flexibility, and compatibility, making it a popular choice for personal use and development.

Using VMware and VirtualBox to Implement Windows 7 and Ubuntu Operating Systems

Both VMware and VirtualBox can be used to install and run different operating systems in virtual environments. Here's a brief guide on how to set up Windows 7 and Ubuntu using each platform:

1. **VMware**:

- Download and install VMware Workstation for a hosted environment or VMware ESXi for a bare-metal setup.
- Create a new virtual machine and select the desired operating system (e.g., Windows 7 or Ubuntu).

- Allocate system resources such as CPU, RAM, and disk space based on the requirements of the OS.
- Install the OS using an ISO file or installation media, following the on-screen setup instructions.

2. **VirtualBox**:

- Download and install VirtualBox from Oracle.
- Open VirtualBox and create a new virtual machine, specifying the operating system (Windows 7 or Ubuntu) and version.
- Configure resources such as memory and storage, then attach the OS installation ISO.
- Start the virtual machine, and follow the installation steps to set up Windows 7 or Ubuntu.

Both VMware and VirtualBox provide the flexibility to run multiple operating systems on a single host, making it easy to experiment with and deploy different environments without needing additional hardware.

This write-up provides an overview of bare-metal hypervisors, types of bare-metal hypervisors, and the process of using VMware and VirtualBox for setting up virtual operating systems like Windows 7 and Ubuntu.