



1.2.1 BIOS, Device Drivers & Virtual Machines

BIOS

BIOS (basic input output system) is a **program that is stored in ROM that is used when a computer starts up.**

When a computer starts, the BIOS performs checks on the hardware, including checking which input and output devices are connected and whether they are working correctly.

It then starts the process of loading the operating system from secondary storage into RAM.

If the BIOS became corrupted or was overwritten, the computer might not be able to start correctly, perform its hardware checks or begin loading the operating system.

Device Drivers

A device driver is software that **allows the operating system to communicate with and control a specific hardware device.**

It provides an interface between the operating system and the hardware.

E.g. Printer Driver, Mouse Driver, Webcam Driver

Virtual Machines

A virtual machine (VM) is software that **emulates a physical computer, allowing an operating system and its programs to run in an isolated virtual environment.**

One use for virtual machines is to run a different operating system within a computer's native operating system.

Virtual machines allow software to be tested in different operating-system environments from a single computer, without having to set up separate physical machines. This can save space, time and money.

A powerful computer may be required because the host operating system, virtual machine and programs running inside the VM all require processor, memory and storage resources.

Programs running in a virtual machine may run more slowly than programs compiled directly for the host computer's architecture.

Instead of compiling the program directly for each target architecture, the source code can be compiled into an intermediate language such as bytecode.

The source code is compiled into an intermediate language such as bytecode. The bytecode is portable and can be used on multiple systems. The virtual machine converts or interprets the intermediate code so that it can be executed on the target system.





This allows the same program to run on different systems, provided each system has a suitable virtual machine.

