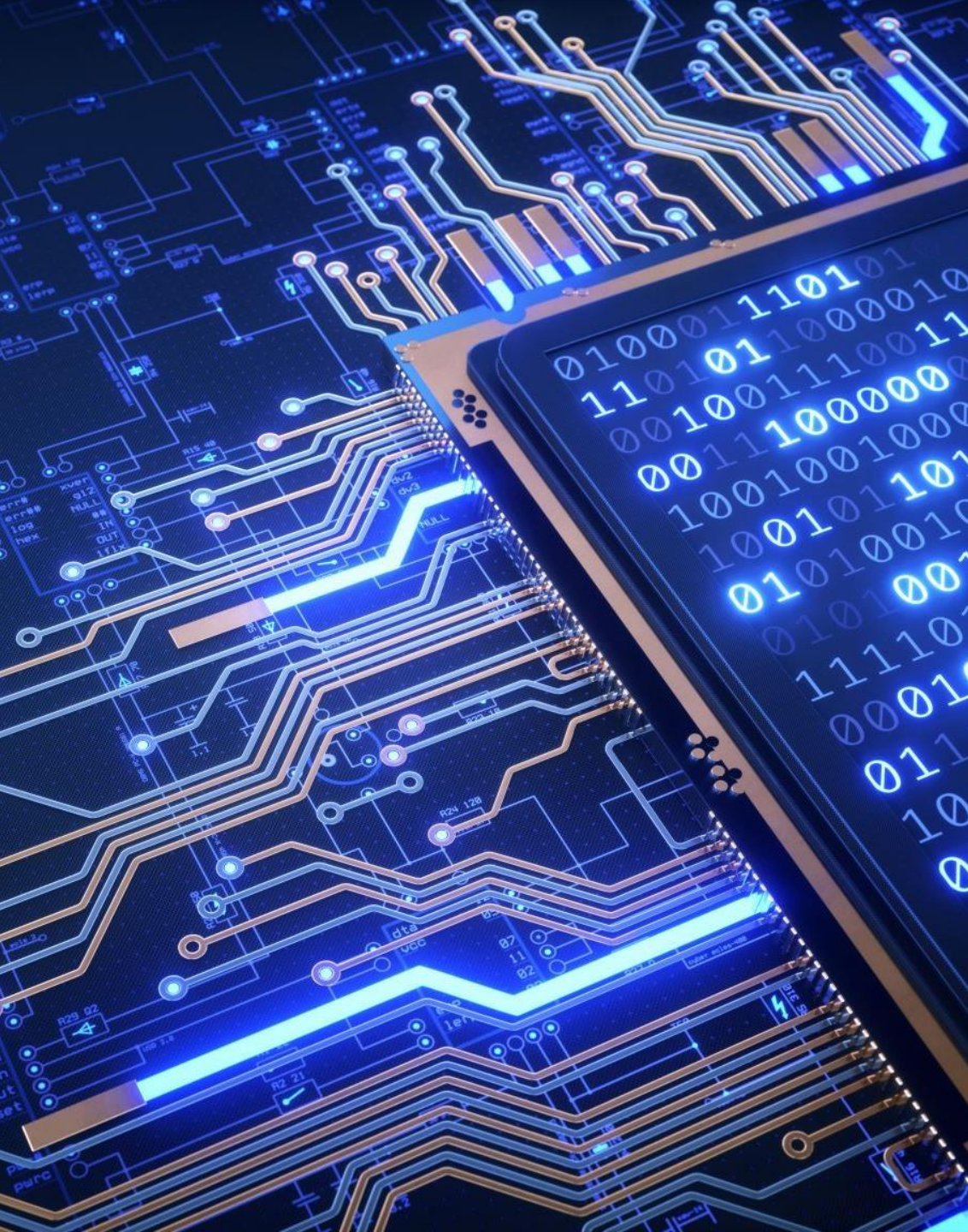# Virtual Machines!

CCC 2023

What are they used for?

- Imagine you have a powerful computer, and you want to do different tasks on it. Instead of using the computer for just one thing, you can create virtual machines inside it. These virtual machines are like mini-computers within your main computer. They act as if they are real computers, but they are actually software-based simulations.

- Testing development

- Isolation and Security

- Server Hosting

- Educational purposes

Virtual Machine Components

Physical Machine - A *physical machine*, also known as the host operating system, has the hardware, such as the hard disk drive(s), optical drive, RAM, and motherboard.

Virtual machine - A *virtual machine*, also known as the guest operating system, is a software implementation of a computer. The virtual machine executes programs in the same way a physical machine executes programs. The virtual machine appears to be a self-contained and autonomous system.

Virtual hard disk (VHD) - A *virtual hard disk* (VHD) is a file created within the host operating system and simulates a hard disk for the virtual machine.

Hypervisor - A *hypervisor* is a thin layer of software that resides between the guest operating system and the hardware. A hypervisor allows virtual machines to interact with the hardware without going through the host operating system. There are two types of hypervisors.

Type 1 Hypervisor - A Type I hypervisor is often called a native hypervisor or bare-metal hypervisor. A hypervisor in a dedicated appliance is called an embedded hypervisor. A Type I hypervisor is like a thin operating system that directly interfaces with the computer hardware.

Type 2 Hypervisor - A Type 2 hypervisor is known as a hosted hypervisor. It runs as an application on a conventional operating system. While it may be used in a production environment, a type 2 hypervisor is most often used as a development sandbox.

VMware Workstation player!

- Our Club as of now will be mostly utilizing VMware Workstation player for virtual machines, this is a type 2 hypervisor.

Why are we using virtual machines?

- Our Club will utilize virtual machines to mimic the kind of servers we had on our network within the 2022 competition