NETWORKING & SYSTEM ADMINISTRATION LAB

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Experiment No: 2

Aim

Prepare a comparative study of specification of desktop and server class computers.

Procedure

PC Desktop Specifications

Computer hardware specifications are technical descriptions of the computer's components and capabilities. Processor speed, model and manufacturer. Processor speed is typically indicated in gigahertz (GHz). The higher the number, the faster the computer. Random Access Memory (RAM), This is typically indicated in gigabytes (GB). The more RAM in a computer the more it can do simultaneously. Hard disk (sometimes called ROM) space. This is typically indicated in gigabytes (GB) and refers generally to the amount of information (like documents, music and other data) your computer can hold. Other specifications might include network (ethernet or wi-fi) adapters or audio and video capabilities.

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- **Motherboard:** Gigabyte B560M-DS3H Motherboard
- **Power Supply:** Scaled appropriately to support delivered system with reasonable growth potential (In Win CE685 PC case with 300 watt 80PLUS certified power supply)
- **Case:** In Win CE685 PC case with 300 watt 80PLUS certified power supply
- **CPU:** Intel Core i5-11400 Processor
- **RAM:** 8GB DDR4 2666 (PC4 21333) RAM (1 8GB DIMM)
- **NIC:** On-board 10/100/1000 Mbps based Ethernet NIC
- **HDD:** 250 GB Western Digital M.2 NVMe SSD Part # WDS250G2B0C
- **Video:** Integrated Intel HD Graphics with DVI Digital Output Interface
- **Optical Drive:** (optional)
- **Audio:** Onboard HD audio
- **Externally powered Satellite Speakers:** (optional)
- **6 External Powered USB Ports and 2 on front of case**
- **Operating System:** Microsoft Windows 7 Home Basic(or other least expensive Microsoft Windows operating system)
- **All appropriate cables necessary**
- **HIDs:** USB Optical mouse, mouse pad, USB keyboard, all necessary cables
- **3 year parts and labor warranty on all components**
- **Monitor:** 20″ Wide Screen LCD Monitor (1920×1080 native resolution) with DVI Digital Input Interface

SERVER

- A server is a computer program or device that provides a service to another computer program and its user, also known as the client. In a data center, the physical computer that a server program runs on is also frequently referred to as a server. That machine might be a dedicated server or it might be used for other purposes.

- In the client/server programming model, a server program awaits and fulfills requests from client programs, which might be running in the same, or other computers. A given application in a computer might function as a client with requests for services from other programs and as a server of requests from other programs.

A virtual server is a virtual representation of a physical server. Like a physical server, a virtual server includes its own operating system and applications. These are kept separate from any other virtual servers that might be running on the physical server.

The process of creating virtual machines involves installing a lightweight software component called a <u>hypervisor</u> onto a physical server. The hypervisor's job is to enable the physical server to function as a virtualization host. The virtualization host makes the physical server's hardware resources -- such as CPU time, memory, storage and network bandwidth -- available to one or more virtual machines.

An administrative console gives administrators the ability to allocate specific hardware resources to each virtual server. This helps dramatically drive down <u>hardware costs</u> because a single physical server can run multiple virtual servers, as opposed to each workload needing its own physical server.

Server software

At a minimum, a server requires two software components: an operating system and an application. The operating system acts as a platform for running the server application. It provides access to the underlying hardware resources and provides the dependency services that the application depends on.

The operating system also provides the means for clients to communicate with the server application. The server's IP address and fully qualified domain name, for example, are assigned at the operating system level.

Desktop computers vs. servers

There are both similarities and differences between desktop computers and servers. Most servers are based on X86/X64 CPUs and can run the same code as an X86/X64 desktop computer. Unlike most desktop computers, however, physical servers often include multiple CPU sockets and error correcting memory. Servers also generally support a far greater quantity of memory than most desktop computers.

Because server hardware typically runs <u>mission-critical</u> workloads, server hardware manufacturers design servers to support redundant components. A server might be equipped with redundant power supplies and redundant network interfaces. These redundant components allow a server to continue to function even if a key component fails.

Server hardware also differs from desktop hardware in terms of its form factor. Modern desktop computers often exist as mini towers, designed to be placed under a desk. Although there are still some vendors that offer tower servers, <u>most servers are designed to be rack mounted</u>. These rack mount systems are described as having a 1U, 2U or 4U form factor,

depending on how much rack space they occupy -- a 2U server takes up twice as much rack space as a 1U server.

A rack server is designed to fit into a standard-size metal frame.

Another key difference between a desktop computer and a server is the operating system. A desktop operating system might be able to perform some server-like functionality but isn't designed or licensed to take the place of a server operating system. Windows 10, for example, is a desktop operating system.

Some Windows 10 editions include Hyper-V, Microsoft's virtual machine platform. Even though both Windows 10 and Windows Server can run Hyper-V, Windows 10's hypervisor is intended to be primarily used for development purposes, whereas the version of Hyper-V included with Windows Server is designed for running production virtual servers.

Although an organization could conceivably run a virtual server on top of Windows 10 Hyper-V, there are licensing issues to consider. Additionally, Windows Server Hyper-V includes resiliency features that aren't found in the Windows 10 version. For example, Windows Server supports failover clustering and virtual machine replication.

Similarly, the Windows 10 operating system can make files available to devices on a local network. However, Windows 10 was never designed for large-scale file sharing. Windows Server, however, can be configured to act as a fully featured file server. In large organizations, a distributed file system can be created across an entire server farm for the

purpose of providing better performance, scalability and resiliency than what one physical server would be able to provide by itself.

MAIN DIFFERENCES BETWEEN A DESKTOP AND SERVER

Many people mistakenly believe that a <u>server</u> is no different from a typical <u>desktop computer</u>. This couldn't be further from the truth. While almost any computer that meets the minimum hardware requirements can run a server operating system that alone does not make a desktop computer a true server. Even if the desktop computer had similar processor speeds, memory and storage capacity compared to a server, it still isn't a replacement for a real server. The technologies behind them are engineered for different purposes.

A <u>desktop computer</u> system typically runs a user-friendly operating system and desktop applications to facilitate desktop-oriented tasks. In contrast, a <u>server</u> manages all network resources. Servers are often <u>dedicated</u> (meaning it performs no other task besides server tasks). Because a server is engineered to manage, store, send and process data 24-hours a day it has to be more reliable than a desktop computer and offers a variety of features and hardware not typically used in the average desktop computer.

Types of servers

Servers are often categorized in terms of their purpose. A few examples of the types of servers available are as follows:

- **<u>Web server</u>**: a computer program that serves requested HTML pages or files. In this case, a web browser acts as the client.

- **Application serve**r: a program in a computer in a <u>distributed</u> network that provides the business logic for an application program.

- **<u>Proxy server</u>**: software that acts as an intermediary between an endpoint device, such as a computer, and another server from which a user or client is requesting a service.

- **Mail server**: an application that receives incoming emails from local users -- people within the same domain -- and remote senders and forwards outgoing emails for delivery.

- **Virtual server**: a program running on a shared server that is configured in such a way that it seems to each user that they have complete control of a server.

- **Blade server**: a server chassis housing multiple thin, modular electronic circuit boards, known as server blades. Each blade is a server in its own right, often dedicated to a single application

- **File server**: a computer responsible for the central storage and management of data files so that other computers on the same network can access them.

- **Policy server**: a security component of a policy-based network that provides authorization services and facilitates tracking and control of files.

- **Database server**: this server is responsible for hosting one or more databases. Client applications perform database queries that retrieve data from or write data to the database that is hosted on the server.

- **Print server**: this server provides users with access to one or more network-attached printers -- or print devices as some server vendors call them. The print server acts as a queue for the print jobs that users submit. Some print servers can prioritize the jobs in the print queue based on the job type or on who submitted the print job.