**COMPUTER**

**NETWORKING SYSTEM**

**FOR ONLINE PROCESSING**

**BY**

**AKINOLA ZAINAB**

**MATRIC NO: S117202013**

**DEPARTMENT OF COMPUTER SCIENCE/ECONOMICS,**

**COLLEGE OF INFORMATION AND**

**COMMUNICATION TECHNOLOGY (CICOT),**

**CRESCENT UNIVERSITY, ABEOKUTA.**

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**What is Network Operating System?**

Network Operating System is the software that allows multiple computers to communicate, share files and hardware devices with one another. Some popular network operating systems are Novell Netware, Windows *NT*/2000,Linux, Sun Solaris, UNIX, and IBM OS/2*.*It is the software that runs on a server and enables the server to manage data, users, groups, security, applications, and other networking functions.

Network Operating System is a computer operating system that facilitates to connect and communicate various autonomous computers over a network. An Autonomous computer is an independent computer that has its own local memory, hardware, and O.S. It is self-capable to perform operations and processing for a single user. They can either run the same or different O.S.

The Network O.S. mainly runs on a powerful computer that runs the server program. It facilitates the security and capability of managing the data, user, group, application, and other network functionalities. The main advantage of using a network o.s. is that it facilitates the sharing of resources and memory amongst the autonomous computers in the network. It can also facilitate the client computers to access the shared memory and resources administered by the Server computer. In other words, the Network O.S. is mainly designed to allow multiple users to share files and resources over the network.

The Network O.S. is not transparent in nature. The workstations connected in the network are aware of the multiplicity of the network devices. The Network Operating Systems can distribute their tasks and functions amongst connected nodes in the network, which enhances the system overall performance. It can allow multiple access to the shared resources concurrently, which results in efficiency. One of the major importance of using a Network O.S. is remote access. It facilitates one workstation to connect and communicate with another workstation in a secure manner. For providing security, it has authentication and access control functionality. The network o.s. implements a lot of protocols over the network, which provides a proper implementation of the network functionalities. One drawback of Network O.S. is its tightly coupled nature in the network.

Some examples of Network O.S. are Novel Netware, Microsoft Windows server (2000, 2003, and 2008), UNIX, Linux, etc.

TherearemainlytwotypesofNetworkO.S*.,* theyare*:*

* Peer-to-Peer
* Client**-**Server

1. **Peer-to-Peer**

Peer-to-Peer Network Operating System is in which all the nodes are functionally and operationally equal to each other**.**No one is superior or inferior. They all are capable to perform similar kinds of tasks. All the nodes have their own local memory and resources. Using the Network O.S., they can connect and communicate with each other. They can also share data and resources with one another. One node can also communicate and share data and resources with a remote node in the network by using the authentication feature of the Network O.S. The nodes are directly connected with each other in the network with the help of a switch or a hub.

**Advantages of Peer-to-peer Network Operating System**

* Easy to install and setup.
* The setup cost is low.
* There is no requirement for any specialized software.
* The sharing of information and resources is fast and easy.

**Disadvantages of Peer-to-peer Network Operating System**

* The performance of autonomous computers may not be so good when sharing some resources.
* There is no centralized management.
* It is less secure.
* It does not have backup functionalities.
* There is no centralized storage system.

1. **Client-Server**

The Client-Server Networking Operating System operates with a single server and multiple client computers in the network. The Client O.S. runs on the client machine, while the Network Operating System is installed on the server machine. The server machine is a centralized hub for all the client machines. The client machines generate a request for information or some resource and forward it to the server machine. The server machine, in turn, replies to the client machine by providing appropriate services to it in a secure manner. The server machine is a very powerful computer that is capable of tackling large calculations and operations. It can also have the ability to administer the whole network and its resources. It can be multiprocessing in nature, which can process multiple client requests at the same time. The Network O.S. enhances the reach of client machines by providing remote access to other nodes and resources of the network in a secure manner.

**Advantages of Client-Server Network Operating System**

* It has centralized control and administration.
* It has a backup facility for lost data.
* The shared data and resources can be accessed concurrently by multiple clients.
* It has better reliability and performance.

**Disadvantages of Client-Server Network Operating System**

* The setup cost is very high.
* There is a requirement of specialized software for client and server machines to function properly.
* There is a need for an administrator to administer the network.
* There may be network failure, in case of central server failure.
* A huge amount of client requests may overload the server.

**Following are the common functionalities of the Network Operating System**:

* Data and Resource sharing
* Performance
* Security
* Robustness
* Scalability

**Features of Network Operating System**

* It allows multiple computers to connect so that they can share data, files and hardware devices.
* Provide basic operating system features such as support for processors, protocols, automatic hardware detection and support multi-processing of applications.
* Provide security features such as authentication, login restrictions, and access control.
* Provide name and directory services.
* Provide file, print, web services and back-up services.
* Support Internetworking such as routing and WAN ports.
* User management and support for logon and logoff, remote access; system management, administration, and auditing tools with graphical interfaces.
* It has capabilities.
* It also provides basic network administration utilities like access to the user.
* It also provides priority to the printing jobs which are in the queue in the network.
* It detects the new hardware whenever it is added to the system.

**Characteristics of Network Operating System**

1. **The first characteristic of network operating systems is the support component:**Network operating systems provide support for the multiple processors, applications, and hardware devices that make up a network. The systems support the users accessing the network as well as process requests for specific documents and usage of hardware. NOSs also provide protocol requests from users, including Transmission Control Protocol/Internet Protocol (TCP/IP) and other protocols.
2. **The second characteristic of network operating systems is the security component:**NOSs manage the authorization and authentication of users, computer workstations, and other devices accessing a network. If an intruder tries to access a network, the NOS blocks the unauthorized user/computer and logs the intrusion attempt within its log files. The NOS also manages software and hardware installations to keep users from installing unauthorized software and devices.
3. **The third characteristic of network operating systems is the user setup component:**Network operating systems create user accounts and manage the users logging into and out of the network. The systems also manage what file and directory services a specific user has access to, users accessing the network remotely, and how the network graphical interface looks to specific users.
4. **The fourth characteristic of network operating systems is the printing and file services component:** Like other operating systems, network operating systems manage all printing, storage, backup, and duplication services for computers and users accessing a network. The systems also control access to the Internet, local-area (LAN) and wide-area networks (WAN), port routing, and internal web services known as Intranet. NOS filters documents and files through the printing/file services immediately. More than one user can send documents and files through the network for printing, backing up, or other types of processing.
5. **The Fifth and final characteristic of network operating systems is the email component:** A NOS manages electronic mail, also known as email, for the entire network, including users accessing the NOS remotely and from the Internet. The NOS blocks SPAM and other problematic emails and sends/receives the email, as well as lets users, create additional email accounts.

**Advantages of Network Operating System**

* Highly stable centralized servers.
* Security concerns are handled through servers.
* New technologies and hardware up-gradation are easily integrated into the system.
* Server access is possible remotely from different locations and types of systems.

**Disadvantages of Network Operating System**

* Servers are costly.
* User has to depend on a central location for most operations.
* Maintenance and updates are required regularly.

**Network Operating System Software**

The following links include some of the more popular peer-to-peer and client/server network operating systems.

* Macintosh OS X.
* Microsoft Windows Server.
* UNIX.
* Linux.

**What is Online Processing?**

Online processing is the ongoing entry of transactions into a computer system in real time. The opposite of this system is batch processing, where transactions are allowed to pile up in a stack of documents, and are entered into the computer system in a batch. Online processing is a major factor in improving the usability of computer reports, since the information on them is more current.

From a labor utilization perspective, batch processing can be more efficient than online processing, since employees can plow through a large number of transactions within a short period of time. However, the attendant reduction in the real time accuracy of information in this environment still makes batch processing a lesser alternative to online processing.

**Example of Online Processing**

A warehouse staff can use online processing to scan the bar codes attached to items in the warehouse, thereby documenting the movement of these items from place to place in the warehouse. Someone looking for inventory can then rely upon this information to determine the current location of the inventory. Under an older batch processing system, these inventory transfer transactions might not be loaded into the computer system until the following day - until then, the inventory location information stored by the system is inaccurate. Thus, the use of online processing ensures that inventory records exactly match actual unit counts in the warehouse at all times.

**Advantages of online processing systems:-**

* Easy to use to do shopping online
* These systems have quick response time
* It is easy to use just form filling and your job get processed automatically by web and database servers
* Online banks nowadays use online processing systems for money transactions
* Usage of credit cards is also handled by these systems
* You can access anything worldwide online and purchase it on the spot by bank wire transfer, credit cards, and online banks. All these systems are handled by online processing

**Disadvantages of online processing systems:-**

* There occurs millions of requests to banks at a time which is difficult to handle
* During purchases if servers hang out for few seconds then transactions get interrupted, so not good for big websites and organization and high traffic sites
* All user data like credit card details, email addresses are kept on database servers so if website get hacked or data loosed then it creates problem. For example Linkedin website which get hacked and email and password get accessed by hackers and then displayed credential details of users on internet by hackers
* If any hardware failure occurs in online processing systems then visitors of website get in trouble and online transaction get stopped and effected
* Electricity problem is another issue i.e. if electric supply get off so backup of generators and hardware devices in better
* Online processing involves lot of staff to maintain inventory
* There should be make some relation with banks so if any transaction problem occurs then banks handle it correctly
* Transferring products to people physically is also another problem
* Some issue also get involved during creation of new accounts by visitors