



MINISTRY OF EDUCATION
TVET Federal Agency
Ethiopia

ICT543 - System and Network Administration

LO I: Introduction to System and Network Administration

Federal TVET Institute
Department of Information and Communication Technology
Master of Science in ICT Teachers Education

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Learning Objectives: At the end of the topic, the students will be able to:

- Learn the foundation of network and system administration
- Know the scope, duties and responsibilities of network and system administrator
- Know the network operation system that support system administration
- Distinguish the support of each network operating system

I. Overview

- **Network and system administration** is a branch of engineering that concerns the operational management of human–computer system.
- It is unusual as an engineering discipline in that it addresses both the technology of computer systems and the users of the technology on an equal basis.
- The terms ***network administration*** and ***system administration*** exist separately and are used both variously and inconsistently by industry and by academics.

2. System Administration

- **System administration** is the term used traditionally by mainframe and Linux engineers to describe the management of computers whether they are coupled by a network or not.
- **Today, System Administration** is the **design, installation, configuration, operation, and support** of these servers to support the operation need of information technology infrastructure of an organization.

System Administrator

- Generally it is **planning, installing, and maintaining computer systems** involving servers and clients that works together in a network environment using operation system like Windows 2012 Server or Linux platform.
- A **system administrator**, or **sysadmin**, is a person who is responsible for the upkeep, configuration, and reliable operation of computer systems; especially multi-user computers, such as servers.

Duties of a system administrator

1. **User administration (setup and maintaining account)**
2. **Maintaining system**
3. **Verify that peripherals are working properly**
4. **Quickly arrange repair for hardware in occasion of hardware failure**
5. **Monitor system performance**
6. **Create file systems**
7. **Install software**
8. **Create a backup and recover policy**
9. **Monitor network communication**
10. **Update system as soon as new version of OS and application software comes out**
11. **Implement the policies for the use of the computer system and network**
12. **Setup security policies for users. A sysadmin must have a strong grasp of computer security (e.g. firewalls and intrusion detection systems)**

Duties of a system administrator (continue)

1. **Install patches**
2. **Review system logs**
3. **Report malicious or suspicious activity on systems to ISO immediately**
4. **Report sensitive information stored on systems to ISO**
5. **Maintain user access administration**
6. **Disaster recovery planning**
7. **Physical security**
8. **Disable unnecessary services on servers**
9. **Generate/Retain system backups**
10. **Identify secondary system administrator(s)**
11. **Comply with password requirements**
12. **Access control**
13. **Environmental protection (i.e., protection from possible exposure to water damage, excessive heat, etc.)**
14. **Security training will be required every three (3) years**

3. Network Administration

- **Network administration** means the management of network infrastructure devices (routers and switches).
- A **network administrator** is an individual that is responsible for the maintenance of computer hardware and software systems that make up a computer network including the maintenance and monitoring of active data network or converged infrastructure and related network equipment

3. Network Administration

- The actual role of the network administrator will vary from place to place, but will commonly include activities and tasks such as network address assignment, management and implementation of routing protocols such as ISIS, OSPF, BGP, routing table configurations and certain implementations of authentication (e.g.: challenge response, etc.). It can also include maintenance of certain network servers: file servers, VPN gateways, intrusion detection systems, security, etc.

4. Ethical issues in SA/NA

- Because computer systems are human–computer communities, there are ethical considerations involved in their administration. Even if certain decisions can be made objectively, e.g. for maximizing productivity or minimizing cost, one must have a policy for the use and management of computers and their users.

5. What is a Network Operating System?

- Network operating system refers to software that implements an operating system of some kind that is oriented to computer networking. For example, one that runs on a server and enables the server to manage data, users, groups, security, applications, and other networking functions. The network operating system is designed to allow shared file and printer access among multiple computers in a network, typically a local area network (LAN), a private network or to other networks

Windows Server

- **Windows Server** is a brand name for a group of server operating systems released by Microsoft. It includes all Windows operating systems branded "Windows Server", but not any other Microsoft product. The first Windows server edition to be released under that brand was Windows Server 2003. However, the first server edition of Windows was Windows NT 3.1 Advanced Server, followed by Windows NT 3.5 Server, Windows NT 4.0 Server, and Windows 2000 Server; the latter was the first server edition to include Active Directory, DNS Server, DHCP Server, Group Policy, as well as many other popular features used today.

Windows Server

- **Windows Server 2012 R2** is the sixth version of Windows Server family of operating systems. It was released on October 18, 2013. According to Windows Server 2012 R2 datasheet published on May 31, 2013, there are four editions of this operating system: Foundation, Essentials, Standard and Datacenter. Unlike its predecessor, Windows Server 2012 can switch between "Server Core" and "Server with a GUI" installation options without a full reinstallation. Server Core - an option with a command-line interface only - is now the recommended configuration.

Solaris

- **Solaris** is a Unix operating system originally developed by Sun Microsystems. It superseded their earlier SunOS in 1993. **Oracle Solaris**, so named as of 2010, has been owned by Oracle Corporation since the Sun acquisition by Oracle in January 2010

Linux Server

- A Linux server is a high-powered variant of the Linux open source operating system that's designed to handle the more demanding needs of business applications such as network and system administration, database management and Web services.
- Linux servers are frequently selected over other server operating systems for their stability, security and flexibility advantages. Leading Linux server operating systems include CentOS, Debian, Ubuntu Server, Slackware and Gentoo.

MAC OS x Server

- **MacOS Server**, formerly **Mac OS X Server** and **OS X Server**, is a separately sold operating system add-on which provides additional server programs and management and administration tools for macOS.
- Prior to version 10.7 (Lion), OS X Server was a separate but similar Unix^[3] server operating system from Apple Inc. architecturally identical to its desktop counterpart OS X. With the release of version 10.7 (Lion), Mac OS X and Mac OS X Server were combined into one release and re-branded as **OS X**.

References:

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Thank You!!!