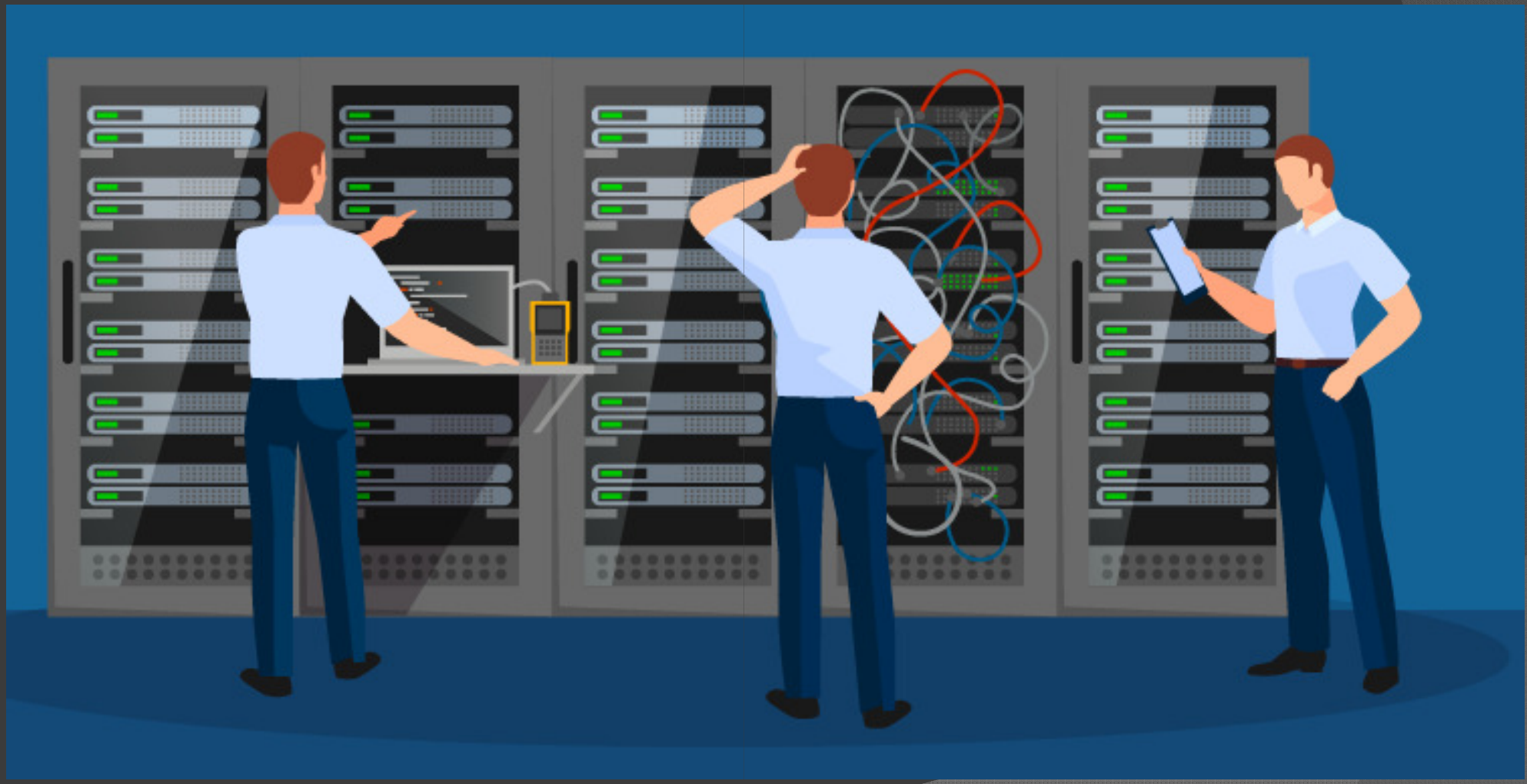
INTRODUCTION TO SYSTEM/NETWORK ADMINISTRATION



Why Organization needs a System/Network Administrator

- Group into 3 then write down on a 1/4 sheet of paper 8 possible problems/errors on the infrastructure whether hardware/network or software infrastructure.

Information Technology Employment Opportunities

Information Technology

- Definition: the development, implementation, and maintenance of computer hardware and software systems to organize and communicate information electronically

Information Technology Career Pathways

1. Network Systems
2. Information Support & Services
3. Web & Digital Communications
4. Programming & Software Development

Information Technology Types of Jobs

Network Systems Pathway

- Network architects
- Network engineers
- Network & computer systems administrators
- Database administrators
- Computer Security Specialists
- Telecommunications specialists

Information Technology Types of Jobs

Information Support & Services Pathway

- Technical support specialists
- Help-desk technicians
- Equipment Repair Technicians
- Information Systems Managers

Information Technology Types of Jobs

Web & Digital Communications Pathway

- Desktop Publishers
- Technical Writers
- Telecommunications line installers
- Telecommunications line repairers
- Multimedia Artist/Animators
- Web developers

Information Technology Types of Jobs

Programming & Software Development Pathway

- Software Engineers
- Computer Systems Engineers
- Computer Programmers

NETWORK ADMINISTRATION

Network administration can be defined as: “branch of engineering that concerns the operational management of human-computer systems”

Responsibilities of the Network Administrator

- **Designing the Network**
- **Setting Up the Network**
- **Maintaining the Network**
- **Expanding the Network**

NEED FOR NETWORK ADMINISTRATOR – OVERVIEW OF NEEDS

- Computers are very much in-demand into almost different organization and industries. Also, the network facilities importance has been integrated to the operation of the organization.
- The goal is to make the infrastructure and systems 100% operational.
- To do that, every possible type of errors and failures are needed to be considered :

1. Hardware Failure
2. Application/Program Errors
3. Data Corruption
4. Power Outage
5. Security Concern
6. Human Error
7. Natural Hazard
8. Procedural Error

THE ROLE OF COMPUTERS IN THE WORKPLACE AT PRESENT

- Computers increasingly are becoming very integral part of a business/organization's systems.

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e.g. 1. Manufacturing

2. IP Phone - telephone operates over computer network, using the computer infrastructure. This saves costs in some ways but if the network is down, so are the phones.

3. New applications fro Computers

4. Credit Card processing

5. Online Systems

6. Document Imaging System

7. Geographical Information System

8. Online Bill Payments

Skills for Computer Support Work

- **Attention to detail and ability to work with many small details.**
- **Ability to think ahead and consider many possible scenarios.**
- **Need to constantly learn new things.**
- **Ability to do research.**
- **Need to be organized and be able to prioritize.**

What are the things that you may like About Computer Support Work

- Challenging work which makes it interesting, but can be stressful at times.
- Everything changes very quickly so it is rarely boring.
- Doing research is a big part of the job which you may enjoy.
- It is such a thrill when you are putting in a new system and everything comes together.

Types of Administrators/Users

In a larger company, following may all be separate positions within a computer support or Information Services (IS) department. In a smaller group they may be shared by a few sysadmins, or even a single person.

- Database Administrator
- Network Administrator
- Security Administrator
- Web Administrator
- Technical support
- computer operator

Types of Administrators/Users

- A **database administrator** (DBA) maintains a database system, and is responsible for the integrity of the data and the efficiency and performance of the system.
- A **network administrator** maintains network infrastructure such as switches and routers, and diagnoses problems with these or with the behavior of network-attached computers.
- A **security administrator** is a specialist in computer and network security, including the administration of security devices such as firewalls, as well as consulting on general security measures.

Types of Administrators/Users

- A **web administrator** maintains web server services (such as IIS or Apache) that allow for internal or external access to web sites. Tasks include managing multiple sites, administering security, and configuring necessary components and software. Responsibilities may also include software change management.
- **Technical support** staff respond to individual users' difficulties with computer systems, provide instructions and sometimes training, and diagnose and solve common problems.
- A **computer operator** performs routine maintenance and upkeep, such as changing backup tapes or replacing failed drives in a RAID array. Such tasks usually require physical presence in the room with the computer; and while less skilled than sysadmin tasks require a similar level of trust, since the operator has access to possibly sensitive data.

What Does a Network Administrator Do?

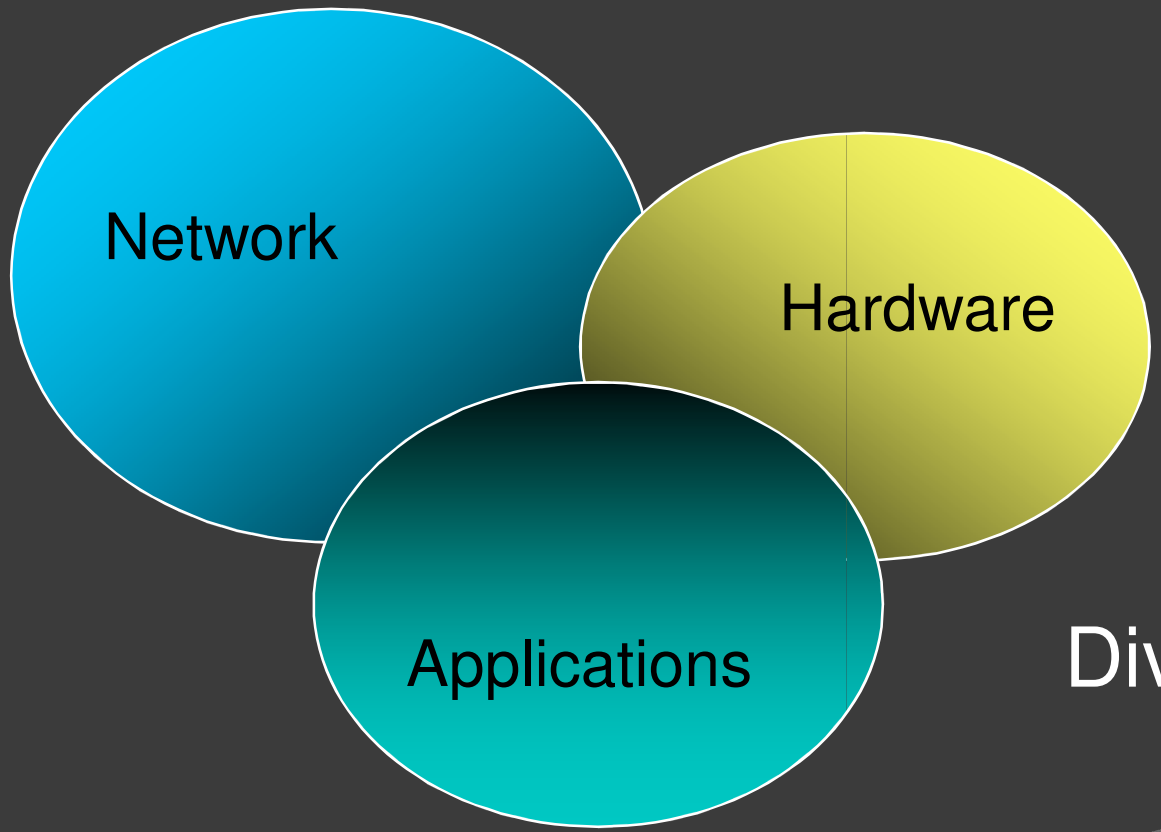
Roles will vary, What is a Network Administrator in charge of:

- Deployment, configuration, maintenance, and monitoring of active network equipment.
- Overall health of the network.
- Maintenance of Network facilities.
- Maintenance of Network Servers.
- Keeping the organization connected.
- Upgrades and Installs.
- Troubleshooting.
- Patching Systems.
- Monitoring for possible problems
- Documentation.
- Adding and Deleting Network Users

Network Management

- Network management is the process of controlling a complex data network to maximize its efficiency and productivity
- The overall goal of network management is to help with the complexity of a data network and to ensure that data can go across it with maximum efficiency and transparency to the users

Structure of Systems and Network Management Organisation



Division of Labour

Network Management

- The International Organization for Standardization (ISO) Network Management Forum divided network management into five functional areas (FCAPS):
  - Fault Management
  - Configuration Management
  - Accounting Management
  - Performance Management
  - Security Management

Fault Management

- Is the process of locating problems, or faults, on the data network
- It involves the following steps:
  - Discover the problem
  - Isolate the problem
  - Fix/Replace the problem (if possible)

Configuration Management

- The configuration of certain network devices controls the behavior of the data network
- Configuration management is the process of finding and setting up (configuring) these critical devices

Security Management

- Is the process of controlling access to information on the data network
- Provides a way to monitor access points and records information on a periodic basis
- Provides audit trails and sounds alarms for security breaches

Performance Management

- Involves measuring the performance of the network hardware, software, and media
- Examples of measured activities are:
  - Overall throughput
  - Percentage utilization
  - Error rates
  - Response time

Accounting Management

- Involves tracking individual's utilization and grouping of network resources to ensure that users have sufficient resources
- Involves granting or removing permission for access to the network

Challenges of Administration

- Design Logical, Efficient networks
- Easily deploy & update many machines
- Decide what services are needed
  - know the business tasks & customers
- Plan and implement adequate security
- Provide comfortable User environment
- Be able to fix errors and problems
- Keep track of & be able to update technology knowledge

Style of Network Administration

Comparison of System/Network Management Styles

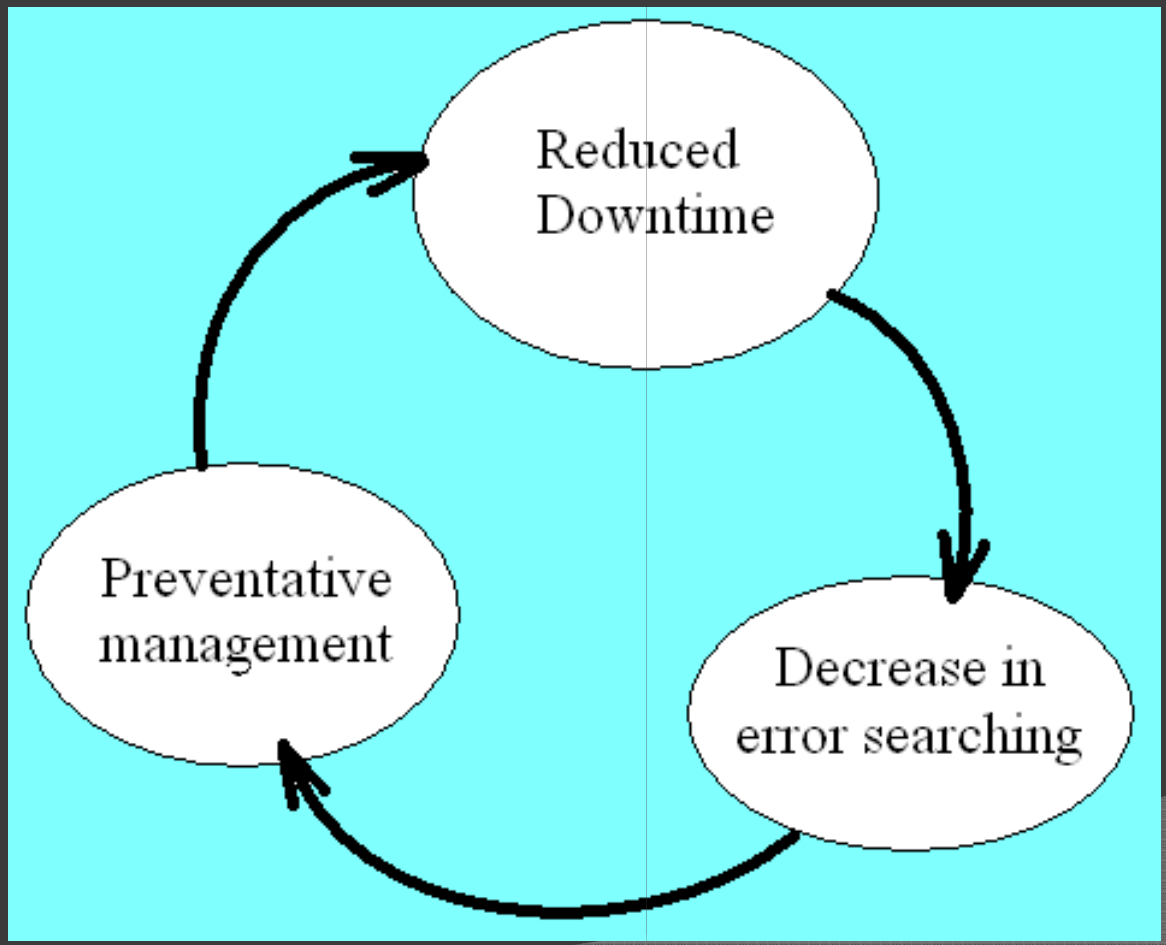
- Fire-Fighting
  - Managing by responding to situations when they happen (Reactive)
- Preventative management
  - Monitor network and make repairs and changes before problems appear (Proactive)
- These are two opposite extremes.
  Most real managers combine both.

Fire-Fighting

- Investigate the Fault or Problem
  - Isolate the problem and identify/define it
  - Use tests and tools to diagnose the problem
  - Solve the problem and document the solution
- Prioritize multiple problems

Preventative Management

- The Good Circle management cycle



Preventative Management Techniques

- Capacity Planning
- Simulation and Testing
  - load generators
  - Benchmarks
- Performance Monitors and System Tuning
  - Network analysis and modelling
  - Load balancing
  - Hardware upgrades