CSNB113: System Administration

Introduction

- A **system administrator**, or **sysadmin**, is a person employed to maintain, and operate a computer system (sometimes also network).

  System administrators may be members of an information technology department.

  – Source: Wikipedia

Introduction

- The duties of a system administrator are wide-ranging, and vary widely from one organization to another.

- Usually charged with installing, supporting, and maintaining servers or other computer systems, and planning for and responding to service outages and other problems.

- Other duties may include scripting or light programming, project management for systems-related projects, supervising or training computer operators, and being the consultant for computer problems beyond the knowledge of technical support staff

Skill Required for SA

- The *subject matter* of systems administration includes computer systems and the ways people use them in an organization.

- This entails a knowledge of operating systems and applications, as well as hardware and software troubleshooting, but also knowledge of the purposes for which people in the organization use the computers.

Skill Required for SA

- The most important *skill* to a system administrator is problem solving. The sysadmin is on call when a computer system goes down or malfunctions, and must be able to quickly and correctly diagnose what is wrong and how best to fix it.

SA's responsibilities

- Routine audits of systems and software.
- Performing backups.
- Applying operating system updates and configuration changes.
- Installing and configuring new hardware and software.
- Adding, removing, or updating user account information, resetting passwords, etc.
- Answering technical queries.
- Responsibility for security.
- Responsibility for documenting the configuration of the system.
- Troubleshooting any reported problems.
- System performance tuning.
- Keeping the system (network) up and running.

SA's responsibilities

- System administrators are not software engineers or developers. It is not usually within their duties to design or write new applications software.

- However, sysadmins must understand the behavior of software in order to deploy it and to troubleshoot problems, and generally know several programming languages used for scripting or automation of routine tasks.

Categories of SA

- 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 security, including the administration of security devices such as firewalls.

- Technical **support staff** (also called **helpdesk**) 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.

Some Important Items

- IT Policy
  - Usage of the system to complete tasks
  - Procedure – how to complete the tasks
  - Users - who use the system
- Security
  - The safety of the system from malicious activities
- Documentation
  - Record the process for future reference

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Relevant Terms and Details

- Uptime
  - Gives the time that the system is running ('up'), or should be up It is indicated either as
    - Time since last reboot
    - % of time the system is up (usually measured per year. The 'Gold Standard' here is the 'Five Nines': 99.999% of the time the system is up.
- Downtime
  - Gives the time when the system is 'down'
  - Distinguish:
    - Scheduled (planned) downtime: the sysadmin purposely shuts down or reboots the system; eventually the users are informed in advance
    - Unscheduled (unplanned) downtime: the system fails:'crash', no power, BSOD (Blue Screen Of Death), kernel panic

Precautions against unscheduled downtimes

- Uninterruptable Power Supply (UPS)
  - Provides immediately 'kick-in' continuous power supply from batteries without affecting the server operation
    - 'Intelligent' UPS communicates with machine:
      A. Warning the operator/user that mains is gone
      B. Shuts down the machine shortly before the batteries are exhausted
- Dual Power Supplies
  - Each is able to power the machine on its own. When one is defunct, the other can take over immediately and completely ('Redundant')
- Dual fans
  - When one fan stops functioning, a second fan sets in automatically and immediately
- Redundant hard disks
  - When one hard disk fails, a replacement hard disk takes over transparently

Extra considerations

- Access
  - Often, servers are located in a common **server room**
    Access can be difficult. Often, System administrators administrate servers **remotely**. This can be done using a Remote Desktop, for example
    - **RDP** (Remote Desktop Protocol)
    - **ssh** (**s**ecure **sh**ell)