

SYSTEM ADMINISTRATORS

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Abstract- 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. The system administrator seeks to ensure that the uptime, performance, resources, and security of the computers he or she manages meet the needs of the users, without exceeding the budget. To meet these needs, a system administrator may acquire, install, or upgrade computer components and software; provide routine automation; maintain security policies; troubleshoot; train and/or supervise staff; or offer technical support for projects.

Index Terms- introduction, training, skills, duties, related fields, System Administrators

I. INTRODUCTION

An individual responsible for maintaining a multi-user computer system, including a local-area network (LAN). Typical duties include:

- Adding and configuring new workstations
- Setting up user accounts
- Installing system-wide software
- Performing procedures to prevent the spread of viruses
- Allocating mass storage space

The system administrator is sometimes called the *sysadmin* or the *systems administrator*. Small organizations may have just one system administrator, whereas larger enterprises usually have a whole team of system administrators.

II. TRAINING

There are multiple paths to becoming a system administrator. Many system administrators have a degree in a related field: computer science, information technology, computer engineering, information systems, or even a trade school program. On top of this, nowadays some companies require an IT certification. Other schools

have offshoots of their Computer Science program specifically for system administration.

Some schools have started offering undergraduate degrees in System Administration. The first, Rochester Institute of Technology started in 1992. Others such as Rensselaer Polytechnic Institute, University of New Hampshire, Marist College, and Drexel University have more recently offered degrees in Information Technology. Symbiosis Institute of Computer Studies and Research (SICSR) in Pune, India offers Master's degree in Computers Applications with a specialization in System Administration. The University of South Carolina offers an Integrated Information Technology B.S. degree specializing in Microsoft product support.

Several U.S. universities, including Rochester Institute of Technology, Tufts Michigan Tech and Florida State University have graduate programs in system administration. In Norway, there is a special English-taught MSc program organized by Oslo University College in cooperation with Oslo University, named "Masters programme in Network and System Administration." There is also a "BSc in Network and System Administration" offered by Gjøvik University College. University of Amsterdam (UvA) offers a similar program in cooperation with Hogeschool van Amsterdam (HvA) named "Master System and Network Engineering". In Israel, the IDF's ntm course is considered a prominent way to train System administrators.^[9] However, many other schools offer related graduate degrees in fields such as network systems and computer security.

One of the primary difficulties with teaching system administration as a formal university discipline is that the industry and technology changes much faster than the typical textbook and coursework certification process. By the time a new textbook has spent years working through approvals and committees, the

specific technology for which it is written may have changed significantly or become obsolete.

In addition, because of the practical nature of system administration and the easy availability of open-source server software, many system administrators enter the field self-taught. Some learning institutions are reluctant to teach, what is in effect, hacking to undergraduate level students.

Generally, a prospective will be required to have some experience with the computer system they are expected to manage. In some cases, candidates are expected to possess industry certifications such as the Microsoft MCSA, MCS, MCITP, Red Hat RHCE, Novell CNA, CNE, Cisco CCNA or CompTIA's A+ or Network+, Sun Certified SCNA, Linux Professional Institute among others.

Sometimes, almost exclusively in smaller sites, the role of system administrator may be given to a skilled user in addition to or in replacement of his or her duties.

III. SKILLS

The *subject matter* of system 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 trouble shooting, but also knowledge of the purposes for which people in the organization use the computers.

Perhaps the most important skill for a system administrator is problem solving—frequently under various sorts of constraints and stress. The sys admin 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. They may also need to have team work and communication skills; as well as being able to install and configure hardware and software.

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

Particularly when dealing with Internet-facing or business-critical systems, a sysadmin must have a

strong grasp of computer security. This includes not merely deploying software patches, but also preventing break-ins and other security problems with preventive measures. In some organizations, computer security administration is a separate role responsible for overall security and the upkeep of firewalls and intrusion detection systems, but all sysadmins are generally responsible for the security of computer systems

IV. DUTIES

A system administrator's responsibilities might include:

- Analyzing system logs and identifying potential issues with computer systems.
- Introducing and integrating new technologies into existing data center environments.
- Performing routine audit of systems and software.
- Applying operating system updates, patches, and configuration changes.
- Installing and configuring new hardware and software.
- Adding, removing, or updating user account information, resetting passwords, etc.
- Answering technical queries and assisting users.
- Responsibility for security.
- Responsibility for documenting the configuration of the system.
- Troubleshooting any reported problems.
- System performance tuning.
- Ensuring that the network infrastructure is up and running.
- Configuring, adding, and deleting file systems.

In larger organizations, some of the tasks above may be divided among different system administrators or members of different organizational groups. For example, a dedicated individual(s) may apply all system upgrades, a Quality Assurance (QA) team may perform testing and validation, and one or more technical writers may be responsible for all technical documentation written for a company. System administrators, in larger organizations, tend not to be systems architects, system engineers, or system designers.

In smaller organizations, the system administrator might also act as technical support, Database

Administrator, Network Administrator, Storage (SAN) Administrator or application analyst.

V. RELATED FIELDS

Many organizations staff other jobs related to system administration. In a larger company, these 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.

- 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.
- A web administrator maintains web server services (such as Apache or IIS) 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.
- A computer operator performs routine maintenance and upkeep, such as changing backup tapes or replacing failed drives in a redundant array of independent disks (RAID). Such tasks usually require physical presence in the room with the computer, and while less skilled than sysadmin tasks, may require a similar level of trust, since the operator has access to possibly sensitive data.
- A postmaster administers a mail server.
- A Storage (SAN) Administrator can create, provision, add or remove Storage to/from Computer systems. Storage can be attached locally to the system or from a storage area network (SAN) or network-attached storage (NAS). The administrator can also create file systems from newly added storage.

In some organizations, a person may begin as a member of technical support staff or a computer operator, then gain experience on the job to be promoted to a sysadmin position.

VI. CONCLUSION

Information technology operations, or IT operations, are the set of all processes and services that are both provisioned by an IT staff to their internal or external clients and used by themselves, to run themselves as a business.

The definition of IT operations differ throughout the IT industry, where vendors and individual organizations often create their own custom definitions of such processes and services for the purpose of marketing their own products. Usually, they include management, envisioning, planning, design, implementation, construction, deployment, distribution, verification, in stallation, instantiation, execution and maintenance. They endeavor to define common processes and procedures, policies, roles, responsibilities, terminology, best practices and standards for running an enterprise.

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