CNT 4603: System Administration Spring 2014

Introduction

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Introduction To System Administration

- The Wikipedia page for "system administrator" includes a nice discussion of the tasks that system administration is generally thought to include.

- This page draws a rather sharp distinction between administration and software development, but in reality, most professional system administrators spend a lot of time writing scripts.

- While this doesn't make system administrators, software developers per se, it does mean that they need many of the same analytical and architectural skills processed by the software developer.

Introduction To System Administration

- The next several pages summarize some of the main tasks that system administrators are expected to perform.

- These duties are not always carried out by a single person, and at many sites the work is distributed among a team.

- However, at least one person must understand all the components and make sure that every task is being done correctly.

Account Provisioning

- The system administrator adds accounts for new users, removes the accounts of users that are no longer active, and handles all the account-related issues that may arise, e.g., forgotten passwords.

- The process of adding and removing users can be automated, but certain administrative decisions, such as where to put a user's home directory, which machines to create the account on, etc., must still be made before a new user can be added.

- When a user should no longer have access to the system, the user's account must be disabled. All the files owned by the account should be backed up and then disposed of so that the system does not accumulate unwanted baggage over time.

Adding And Removing Hardware

- When new hardware is purchased or when hardware is moved from one machine to another, the system must be configured to recognize and use that hardware.

- Hardware support duties can range from the simple task of adding a printer to the more complex job of adding a disk array.

- Now that virtualization has arrived in the enterprise computing arena, hardware configuration can be more complicated than ever. Devices may need installation at several layers of the virtualization stack, and the system administrator may need to formulate policies that allow the hardware to be shared securely and fairly.

Performing Backups

- Performing backups is perhaps the most important job of the system administrator, and it is also the job that is most often ignored or sloppily done.

- Backups are time consuming and boring, but they are absolutely necessary.

- Backups can be automated and delegated to an underling, but it is still the system administrator's job to make sure that the backups are executed correctly and on schedule, and that the resulting media can actually be used to restore files.

Installing And Upgrading Software

- When new software is acquired, it must be installed and tested, often under several different operating systems and on several types of hardware.

- Once the software is working correctly, users must be informed of its availability and location.

- As patches and security updates are released, they must be incorporated smoothly into the local environment.

Installing And Upgrading Software
(continued)

- Local software and administrative scripts should be properly packaged and managed in a fashion that is compatible with the native upgrade procedures used on the system at your site,

- As this software evolves, new releases should be staged for testing before being deployed to the entire site.

Monitoring The System

- Large installations require constant supervision. Don't expect users to report problems to you unless the issues are severe. Working around a problem is usually faster than taking the time to document and report it, so users often follow the path of least resistance.

- Regularly ensure that email and web services are working correctly, watch log files for early signs of trouble, make sure that local networks are properly connected, and keep an eye on the availability of system resources such as disk space.

- All of these chores are excellent candidates for automations, and a variety of off-the-shelf monitoring systems can help system administrators with these tasks.

Troubleshooting

- System failures are inevitable. It is the administrator's job to play mechanic by diagnosing problems and calling in experts if needed.

- Finding the problem is often harder than fixing the problem.

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Maintaining Local Documentation

- As a system is changed to suit an organization's need, it begins to differ from the plain-vanilla system as described by the documentation.

- Since the system administrator is responsible for making these customizations, it is also the sysadmin's duty to document the local changes.

- This include documenting where cables are run and how they are constructed, keeping maintenance records for all hardware, recording the status of backups, and documenting local procedures and policies.

Vigilantly Monitoring Security

- The system administrator must implement a security policy and periodically check to be sure that the security of the system has not been violated.

- On low-security systems, this chore might only involve a few basic checks for unauthorized access.

- On high-security systems, it may include an elaborate network of traps and auditing programs.

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Fire Fighting

- Although helping users with their various problems is rarely included in a system administrator's job description, it often claims a significant portion of most administrators' workdays.

- System admins are bombarded with problems ranging from "it worked yesterday and now it doesn't! What did you change?" to "I spilled coffee on my keyboard! Should I take it to the water fountain and wash it out?"

- In most cases, your response to these issues affects your perceived value as an administrator far more than does any actual technical skill you might possess. You can either howl at the injustice of it all, or you can delight in the fact that a single well-handled trouble ticket scores as many brownie points as five hours of midnight debugging. You decide!

Baselining

- Baselining is used to generate system reports and correlate system growth and changes over time.

- It is a useful technique to assist in ordering suppliers, spares, hardware and software upgrades in a timely manner.

- Knowing the baseline performance and needs of the system over time is a useful organizational tool and the baseline is often provided by the system administrator.

Planning

- System administrators often devote a great deal of their time to generating reports useful for organizational planning.

- Cost, capacity, logistics (network design, server location, where to install wiring, IP address assignments, etc).

- Cost benefit analysis is a common feature of many planning reports/documents.

Four Rules A System Administrator Should Never Break

1. Backup Everything (and validate the backup regularly).

2. Master the Command Line. (Especially true for Unix/Linux SAs, less true for Windows SAs.)

3. Automate Everything. Routine tasks should not be done manually.

4. Document Everything. Every change to your system should be thoroughly documented.