CSE2005 - Operating Systems Slot-F1

Digital Assignment

Case Study on Fedora operating System

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Design:

→ Fedora OS is a powerful free OS which is the second most commonly used distribution of Linux after Ubuntu.

→ It is based on the Linux OS Kernel architecture

→ It represents a whole new concept in the distribution of open source software where the global community of supporters plays a fundamental role.

→ The latest Fedora 10 features a whole new set of innovative characteristics such as a new solar artwork, faster startup with plymouth, web-based packages installer, ext4 file system support, Sugar desktop environment etc.

→ The default desktop environment is GNOME & the default UI is GNOME Shell.

→ It is a very stable OS with many pre-installed applications and tools.

→ It supports & offers the latest data center technologies.

Process Management :

→ Access to memory, hard disks, networks, audio hardware and other things are also scheduled in Fedora OS.

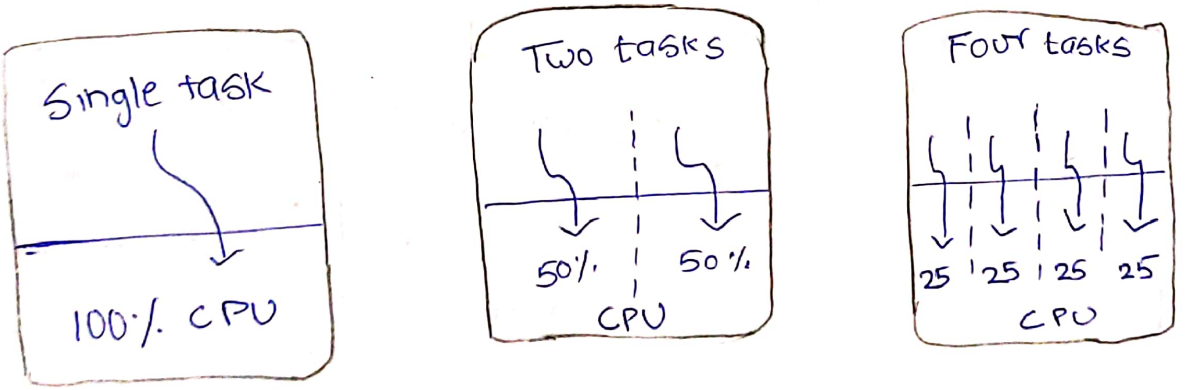
→ Fair queueing ensures all applications have equal access to the computer hardware.

→ Real time scheduling is used to prioritize some processes like audio production environments. This works in a way if a low-priority process & a high-priority process both wants to use the computer's hardware, high-priority process will use the hardware first. It does not prevent processes & applications from starting.

→ Example, Fair queuing is not useful for audio recording processes as Packagekit Update has equal priority with recording, and may cause glitch.

→ where as in realtime scheduling, Packagekit would not use the processor if the audio recoroing application is using hardware.

→ Fair queuing is also called completely Fair scheduler (CFS) which gives each process an equal share of processor power.



→ other algorithm used is Earliest Deadline First (EDF) which follows rule, Priority of an instance is inversely proportional to its absolute deadline. It means the highest priority job is the one with earliest deadline. This is most analyzed dynamic priority algorithm.

→ Process information can be monitored using GNOME (default desktop environment), KDE or from the shell prompt.

→ PS command can be used for process monitoring which gives a snapshot of processes running at the moment the command invoked.

→ nice & renice commands are used to change priority of processes. Kill commands to kill the process in particular

Virtual Memory Management :

→ Virtual memory is implemented in Fedora since it is a multitasking & multi user OS. to execute different processes simultaneously whose cumulated process size can be greater than the primary memory.

→ Virtual memory management is a technique for memory management in Fedora which extends the users memory (primary) by considering hard disk as it's additional RAM.

→ This enables system to run more active applications because virtual memory increases the amount of primary space available.

→ It increases the RAM space by copying areas of RAM which wasn't recently used to the hard disk.

→ It should be made sure that system has enough RAM installed so can handle all the tasks as read/write speed of hard disk is much slower than RAM and OS is required to constantly swap information between RAM & hard disk.

→ Virtual memory management technique can be declared as one of efficient memory management technique for Fedora OS because of these following features and also as hard disk space is much cheaper than RAM space, users need not spend lot of money upgrading their RAM.

File System :

→ Fedora features innovative characteristics by providing support for various file systems.

→ The EXT4 file system is the default & recommended file system used by Fedora workstation and cloud with a maximum supported file size of 50 TB.

→ Some other file systems supported by Fedora are EXT3, EXT2, swap, xfs, vfat, BIOS Boot, EFI System partion etc each of them with special advantages to their own.

→ File system is most basic level of organi-zation in an operating system.

→ The way OS interacts with its users, applications & security are dependent on how OS organizes files on storage devices.

Security :

→ Fedora uses Security-Enhanced Linux by default, which implements variety of security policies, including mandatory access controls.

→ It offers a suite of virus protection, system tools, office productivity services which makes it a secure OS for general purpose.

→ Unlike Ubuntu, a Firewall is present in Fedora right from the start.

→ It is also one of the main promoters for SELinux which stands for security enhanced linux, feature which implements several security policies, which are missing in most of Linox-based distributions.

→ It comes with several custom security enhancements, which makes fedora a very popular choice for web servers.

→ It is as secured as they are also being used for several NASA systems.

Advantages / Disadvantages / Applications and future of OS :

→ Fedora is always free to use, modify & distribute.

→ It offers the same consistency, procedures and functionality as a traditional OS.

→ It is a very stable, secure & light weighted OS which enhances the abilities of software.

→ It keeps all the infrastructure & services under user control making it a very flexible & powerful OS.

→ It supports different types of architectures such as IBM Z, AMD x86-x64, Intel i686, ARM-htp, MIPS-64el etc

→ Fedora OS offers the latest data center technologies and is backed up by ever increasing community who keep creating innovative free open-source software for users.

→ It provides unique security features.

→ This OS updates automatically

→ Supports many file formats.

Disadvantages :

-> Does not provide any standard model for multi-file objects

-> Many windows programs will not run in Fedora OS.

-> Long setup time

-> It has its own server, so cant work on another server in real time.

Applications & Future of Fedora :

-> The high productivity makes Fedora a factory for free open source software innovations where everyone could make a contribution as a volunteer worker.

-> own linux based distribution can be created due to the flexible capabilities of Fedora.

-> The future of CPU Scheduling development of fedora is still open in order to face the challenges of computer & digital world growing.

→ Fedora OS has already been used in many sectors & fields with great efficiency.

→ It is used as operating system for several NASA systems and supercomputers, such as Road runner.

→ This opens the thoughts for undefined future in usage of Fedora OS in a wide range covering most of the fields.

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