CHAMARA K.K.V

E/14/049

CO327 – Operating systems assignment 2

1).What is the purpose of system calls?

System call is a computer program which is requesting the service from the kernel it is executing on. A computer program makes a system call when it makes a request to the operating system's kernel. It provide the service of the operating system to user programs via API. System calls are the only entry points into the kernel system. All programs needing resources must use system calls.

2).***What is the purpose of the command interpreter? Why is it usually separate from the kernel?***

The main function of a command interpreter is to get and execute the next user specified command. A command interpreter is an interface of the operating system with the user. Command-Interpreter is usually not part of the kernel, since multiple command interpreters (shell, in UNIX terminology) may be support by an operating system, and they do not really need to run in kernel mode.

If we want to change the command interpreter looks we can do that if the kernel is separated from the command interpreter. And malicious process to gain access to certain part of the kernel that it showed not have to avoid this ugly scenario it is advantageous to have the command interpreter separate from kernel.

3).What is the purpose of system programs?

System programs can be thought of as bundles of useful system calls. They provide basic functionality to users so that users do not need to write their own programs to solve common problems.

4).What is the main advantage of layered approach to system design? What are the disadvantages of the layered approach?

Because when you have a layered architecture in it is easy to debug and modify. Because changes are affect only in limited area rather than touching all the sections of the operating system. Information is accessible only within a defined and restricted area. We can define them in a one module. Hence the layered approach preferable.

5). Why do some systems store the operating system in firmware, while others store it on disk?

The firmware usually contains all of the code necessary to boot the machine. If the firmware is damaged, the machine will be unusable. Give the relative difficulty of upgrading firmware safely, it is often better to place only immutable code in the firmware, and make any changes / fixes necessary to the operating system on disk.

6).The services and functions provided by an operating system can be divided into two main categories. Briefly describe the two categories, and discuss how they differ

One class of services provided by an operating system is to enforce protection between different processes running concurrently in the system**.** Processes are allowed to access only those memory locations that are associated with their address spaces**.** Also, processes are not allowed to corrupt files associated with other users. A process is also not allowed to access devices directly without operating system intervention**.**

The second class of services provided by an operating system is to provide new functionality that is not supported directly by the underlying hardware**.** Virtual memory and file systems are two such examples of new services provided by an operating system.

7). Describe three general methods for passing parameters to the operating system.

- Pass the parameters using registers (directly).
- Store the parameters in a table in memory and address of that pass to the OS in a register.
- Push the parameters onto the stack and pop off by the OS.

8).What are the advantages and disadvantages of using the same system call interface for manipulating both files and devices?

Because each device can be accessed as file in filesystem. Most kernels deals with the devices though a file interface.it is relatively easy to add a new device driver by implementing the hardware-specific code to support this abstract file interface. Therefore, this benefits the development of both user program code, which can be written to access devices and files in the same manner.

And the disadvantage of this is that it might difficult to capture the functionality of a certain device wit in the context of the file access api. Hence the performance and functionality will be loss.

9).What are the two models of interprocess communication? What are the strengths and weaknesses of the two approaches?

- Message passing model
- Shared memory model

Messages can be exchange between processes either directly or indirectly. It is easy to implement for inter computer communication when it exchange small amount of data. Speed is slow than shared memory model.

In contrast to the message parsing model shared memory model allow maximum speed of communication. But in the areas of protection and synchronization between processes some problems may exists.

10). Why is the separation of mechanism and policy desirable?

Because it provide flexibility to a system. At the same time when you separate the mechanisms and policy to ensure that system is easy to modify. If the interface between mechanism and policy is well defined, the change of policy may affect only a few parameters**.**

11).What is the main advantage of the microkernel approach to system design? How do user programs and system services interact in a microkernel architecture? What are the disadvantages of using the microkernel approach?

- adding a new service does not require modifying the kernel
- It is more secure as more operations are done in user mode than in kernel mode**.**
- A simpler kernel design and functionality typically results in a more reliable operating system.
- Main disadvantage of this approach is that Performance decrease because of function overhead due to context switching etc.

(http://www.answers.com/Q/What_are_the_disadvantages_of_a_microkernel?r2as=1#slide=2)

12).What are the advantages of using loadable kernel modules?

Without loadable kernel modules, an operating system would have to include all possible anticipated functionality already compiled directly into the base kernel. Much of that functionality would reside in memory without being used, wasting memory, and would require that users rebuild and reboot the base kernel every time they require new functionality. Most operating systems supporting loadable kernel modules will include modules to support most desired functionality.

13).Explain why Java programs running on Android systems do not use the standard Java API and virtual machine.

Because they are built for desktop and server systems, not for mobile devices. Google develop separate API and VM for virtual machines.