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OS Assignment 2

Q.1) a) XV6

→ ① XV6 is a teaching operating system developed for MIT course

② XV6 provides the basic interfaces introduced by Ken Thompson and Dennis Richie's Unix OS, also mimicking its internal design.

③ Because it is based on UNIX it's also has a Kernel where services can be accessed by the means of a system call It provides system calls the ones provided by the UNIX.

④ It uses X86 instruction set. The CPU is time shared among processes; it transparently switches the available CPUs among the set of ready processes.

⑤ The XV6 kernel uses file description an integer representing a Kernal managed by object that a process may read or write from as an index in per process table

⑥ In XV6 file system provides data files which contain uninterpreted byte arrays, which contain named references to data files and other directions

⑦ It also supports special node files to that act as interface to I/O device

⑧ XV6 implements a monolithic kernel

Q.1) b) RTOS

→ ① Real time OS are used in environments where a large number of events, mostly external to the computer systems must be prepared, accepted and processed in a short time or within certain deadlines.

② Such application are individual control, telephone switching equipment, flight control & real time simulations
③ This system is extremely time bound and deadline must be met
④ The scheduler employs some combination of priority based scheduler to ensure deadlines of important interrupts are met.
⑤ It is very lightweight to improve the performance by cutting down on overheads.
⑥ It is extremely error resilence and employs a watch dog.

Q.1) c) Mobile operating system

→ ① A mobile operating system runs on smart/dumb phones tablets like devices.
② while it performs jobs some or atleast similar to that of desktop OS. It incorporates various other elements and different requirements.
③ At basic level it incorporates a specialized UI, meant for smaller screens and touch interfaces.
④ Because these devices have battery they are very efficient and as such avoid too much load on CPUs whenever possible
⑤ Today majority of smartphones use ARM chips and as such many mobile OSs specifically specifically make use of optimizations made possible by ARM architecture

⑥ A mobile also contains radio receiver & transmitter module to facilitate Radio network connection. The network stack is optimized to correctly make use of this module while ensuring both high performance & optimal battery usage

⑦ The security on these OSs is often very tight and do not follow for admin previleges in most OS unless the device is loaded with a different bootloader and in turn a new OS.

Eg

(i) Android

It is the most common as well as well known mobile based OS based on Linux 2.6 to provide services such as security, memory management, process management, device model etc

(ii) iOS

It is a closed source OS by Apple developed for iPhones & iPods. It is based Darwin, which itself is an open source UNIX like operating system

(iii) KaiOS

It is developed by ~~for~~ Mozilla for dumb keyed phones.