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TE A -19

11th Assignment

Title: Study assignment on process schedul... algo in android and Tizen

Problem statement: study process scheduling algo in android and Tizen

Theory

① Andriced OS

- It is a mobile OS developed by google based on modified version of Linux Kernel and other Open source S/w and designed primarily for touchscreen mobile deivces such as smartphone and tablets.
- In addition Google has further developed Android TV, Android auto, Andriod Wear each with a specialized user interface
- Variants of Andriod are also used in game consoles digital camera, PC's and other electronics
- Andriod is a powerful OS and supports a large no of app in smartphone
- The H/w that supports android S/w is based on ARM architecture
- The android development supports with full java prog lang
- Even other package that are API and JSE are not supported
- the 1st version 1.0 of android developement Kit (SDK) was released in 2008 and latest

updated version is jelly beans

Some android versions:

Kit Kat (4.4) Marshmallow (6.0) Oreo (8.0)

1.1 Advantages

- Support 2D and 3D Graphics
- support multiple lang
- Java support
- Faster web browser
- Support audio-vedio etc

1.2 Disadvantages

- slow response
- Heat
- Advertisement etc

② Tizen OS

- Tizen is a mobile OS developed by samsung that runs on a wide range of samsung devices including smartphones, tablets, in-vehicle infotainment (IVI) devices, smart smart TV, smart cameras, Blue-ray players smart home appliances and robotic vaccum cleaners
- In 2013 samsung merge its homegrown Bada project in Tizen

- The Tizen association was formed to guide the industry role of Tizen including requirement gathering identifying facilitating service models and overall industry marketing & ~~educt~~ education
- In 2016 Samsung collaborated with Microsoft to bring .Net support to Tizen
- It is currently only one to develope and use Tizen OS.
- The Tizen Association works closly with Linux foundation which support the Tizen Open source project.

Version
April 30 2012 : Tizen 1.0 released
Feb 18 2013 : Tizen 2.0 released
May 20 2017 : Tizen 3.0 released

(3) Android Vs Tizen

- Android developed by google whereas Tizen is developed by Linux Foundation, Tizen association Samsung, Intel
- Android source model is opensource while Tizen is open with SDK closed source.
- Android marketing target includes smartphone Tablets Smart TV etc whereas Tizen target include smartphone Tablets GPS wearable computing, camera, Samsung Smart home
- Android programmed in C, C++, Java and Tizen in HTML5 & C++

- OS family of Android is Linux and that of Tizen is Unix-like.

3.1 Advantages
- Open source OS
- OS is compatible with mobile platform. app built on Tizen can be launced on ios android with few changes.
- It is flexible to many app and adapt too with change
- Immense personalization capability supported by ARM x86 processor

(4) Process scheduling algorithm in Android & Tizen

4.1 Normal scheduling

- Android is based on Linux and uses the LINUX Kernel's scheduling mechanism for determining scheduling policies. This is also true for Java code and threads.
- The Linux time slice scheduling policy combines static and dynamic priorities.
- Process can be given priority from 19 to -20
- This priority will assure that higher priority processes will get more CPU time when needed
- These level are however dynamic low level priority tasks that do not consume CPU time will fine their dynamic priority
- This dynamic behaviour results in an overall better responsiveness

4.2 - Real time scheduling

- The std Linux Kernel provides 2 real-time scheduling policies, sched_FIFO and sched_RR
- The main real-time policy is sched-FIFO.
- It implements FIFO scheduling algo.
- When sched_FIFO task starts running it continues to run until it volunarily yields processor blocker is presented by a higher priority real time task
- It has no time slices All other task of lower priority will not be scheduled until it relinquishes the CPU
- 2 equal-priority sched_FIFO tasks do not preempt each other.
- sched_RR is similar to sched-FIFO except the such task are allocated timeslices based on their priority and run until they exhaust their time slies.
- Non real time task use the sched-Normal scheduling policy

4.3 Thread scheduling

- A Thread scheduler decides which thread in the Android sys should run when and for how long Android's thread scheduler uses 2 main factors to determine scheduling

- Niceness value
- Control groups
- a thread with higher niceness values will run less often than those with lower niceness value.
- niceness val has the range -20 to 19 default val 0
- a new thread inherits the property from the thread where it started
- It is possible to change the priority via o thread.setPriority(int priority) - 0 to 10

4.4. Priority Based Pre-Emptive Task scheduling for Android OS.

- Task scheduling is core which refers to the way the diff processes are allowed to share the common CPU.
- Scheduler and dispatcher are the s/w which help to carry out this assignment.
- Android OS use O(1) scheduling algo as it is based on Linux Kernel 2.6.
- ∴ The scheduler names are completely fair scheduler as the processes can schedule within a constant amount of time regardless of how many process are running on OS.
- Pre-emptive task scheduling involves interrupting the low priority task when high priority task are present in the queue.

- This scheduling is used for mobile OS as the CPU utilization medium, TT time and response time is high.
- Mobile phones are required to meet specific time deadlines for task to occur

4.5 Dynamic priority preemptive scheduling

- earliest-deadline 1st scheduling a job priority is inversely proportional to its absolutely deadline.
- The difference between deadline monotonic scheduling and earliest deadline 1st scheduling is that DM is a static priority algo. EDF is a dynamic priority algo.
- EDF can guarantee that all deadlines are met provided that the total CPU utilization is less than 1

Conclusion

Thus I have studied concept of process Scheduling of Android Tizen OS