Operating Systems: Homework #1

Due on February 10, 2016 at 11:59pm

Professor Qu
Monday & Wednesday 3:30pm — 5:17pm

Nicholas Land

Problem 1

Briefly explaining WHAT CONDITIONS cause a process to move between each of the following 3 states indicated by each arrow (from 1 to 6). Label it N/A if it doesn't happen.

Solution

From running ⇒ ready *1* : Interupt

- An interupt is a signal to the processor emitted by hardware or software indicating an event that needs immediate attention.

From ready ⇒ running *2* : Scheduler Dispatch

- A process that is dispatched is a process that is scheduled to execute.

From ready ⇒ waiting *3* : N/A
From waiting ⇒ ready *4* : I/O or event completion

- An I/O-bound process is a process that spends more time doing I/O than it does computations. Event completion is when the process has finished executing.

From waiting ⇒ running *5* : N/A
From running ⇒ waiting *6* : I/O or event wait

- Event wait is a process that is waiting for some event to occur (such as an I/O completion or reception of a signal).

Problem 2

Question 2. In this question, events are given during the execution of a grading program. You are supposed to understand the process state transition and fill out those blanks and choose the right options. Hint: state transition occurs when some particular events happen. Please use one of ready, running, blocked states as the possible state for the process. When you need to determine the running mode, please use either user or kernel. [Please check and understand these concepts through reading either from the slides or textbook] [19 points: one for each cell in the answer table]

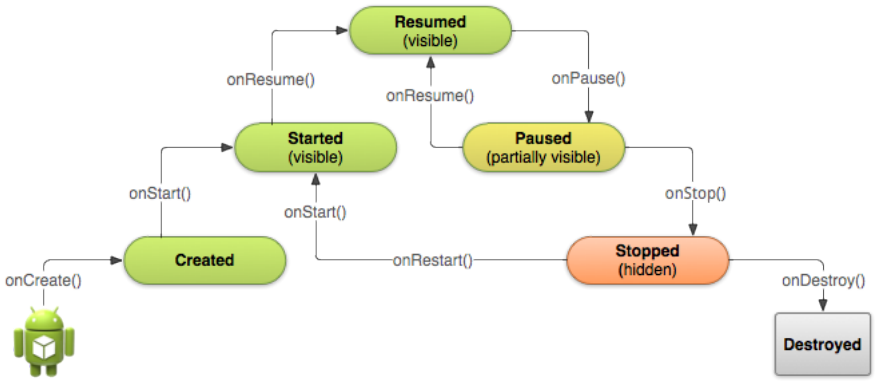
Solution

Q1 : Ready State
Q2 : Running State
Q3 : User Mode
Q4 : Blocked State
Q5 : Kernel Mode
Q6 : Yes
Q7 : Ready State
Q8 : Blocked State
Q9 : Ready State
Q10 : Running State & User Mode
Q11 : Running State to Blocked State
Q12 : Ready State to Running State
Q13 : Kernel Mode
Q14 : Ready State
Q15 : User Mode
Q16 : Ready

Problem 3

Question 3. Case study, in this task, you need to study a process state transition for any real system (linux, wondows, mac, android, ios, etc.). What you need to do is draw (or copy paste) the process state transition diagram and describe the conditions for every transition.

Solution



- When the `onCreate()` method is called the process is created and moves into the `New` process state.
- When the `onStart()` method is called the process moves from `Ready` to `Running`.
- When the `onResume()` method is called the process moves from `Waiting` to `Running`.
- When the `onPause()` method is called the process moves from `Running` to `Waiting`.
- When the `onStop()` method is called the process moves into the `Waiting` state.
- When the `onDestroy()` method is called the process moves from `Waiting` to `Terminated` state.