Operating System : Lab 6

Amit Srivastava(2017CSB1189)

Ques 1.

Android uses **paging** & **mmap**(any memory your application touches cannot be paged out unless you release all references). Android(DVM) sets a **hard limit on the heap size** for each app. If your app has reached the heap capacity and tries to allocate more memory, it can receive an `OutOfMemoryError`.. Android stores background application processes in a **LRU cache**. When the system runs low on memory, it will kill processes according to the LRU strategy, but it will also consider which application is the largest memory consumer. ART/DVM determines that if a piece of memory is no longer being used by the program, it frees it back to the **generational heap**, without any intervention from the programmer. Memory is shared i.e. each app process is forked from an existing process(**Zygote**), most static data is mmapped into a process and shares same dynamic RAM across processes. When inspecting your app's heap, Android computes a value called the **Proportional Set Size (PSS)**, which accounts for both dirty and clean pages that are shared with other processes.

Ques 2.

a. Continuous Memory Allocation : might require relocation of the entire program since there is not enough space for the program to grow its allocated memory space.
b. Pure Paging : incremental allocation of new pages is possible in the scheme without requiring relocation of the program's address space.

Ques 3.

General virtual memory support is not needed when the memory requirements of all applications are well known and controlled. Some examples are smart cards, special-purpose processors (e.g., network processors), and embedded processors. In these situations, we should always consider the possibility of using more real memory. If the operating system did not have to support virtual memory, the code would be much simpler and smaller. On the other hand, some ideas from virtual memory may still be profitably exploited, although with different design requirements. For example, program/thread isolation might be paging to flash memory.

Ques 4.

Yes, it is possible that the values of base and limit registers might be same.

Suppose both base & limit registers are loaded with 16384. This means that program starts at location 16384 in memory and has a length of 16384 indicating that the program occupies all space between 16384 and 32768. So, it is a possibility that they both can be same.