ECE5658: Operating Systems Design – Paper Critique

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이성우

1. Exokernel An Operating System Architecture for Application-Level Resource Management, SOSP 1995

- This paper proposed the Exokernel which manages the hardware resources in application level for user flexibility. Exokernel is a operating system architecture which provides hardware resources management interfaces to the users.
- It improves hardware access speed by enhancing virtual memory and interporcess communication primitives. However, it has big disadvantage that it does not provide management method. The users should manage their hardware resources themselves. So, it must be too difficult to be used by beginners in computer.
- Moreover, it does not mention and treat the state-of art hardware, such as PRAM. Of course, it is the paper of the past. I think it can be improved with this new hardware.

2. Lottery Scheduling: Flexible Proportional-Share Resource Management, OSDI 1994

- This paper proposed the Lottery Scheduling which schedules processes with random pattern for reducing starvation problem.
- Moreover, it provides not only proportionality for processes, but for fairness by time. The currency notion is very interested. However, I wonder what the size of this lottery data structure is. I saw that many lotteries are provided such as 2000 or more in the paper. If many processes are performed concurrently, how much memory it takes up? And does it burden for memory capacity?
- I think this data structures can be optimized. Furthermore, It can consider mobile device environment. Usually, mobile divides processes as foreground and background. Lottery scheduling can be optimized with mobile because this foreground/background notion is similar to priority.