ECE5658: Operating Systems Design – week2 critique

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

(1) The exokernel OS provides a low-level interface to managing hardware resources. Thus, it helps application developers to have a lot of hardware-related decisions. The software programmer can request specific resources from the exokernel through each library OS. Each library OS offers a different abstraction methods, like one monotonic kernel.

(2)

(+): exokernel is small, and exokernel is simpler than monolithic kernels

(-): reduced consistency, complex design

(3) I think exokernel won't work properly in the multitasking processor.

2. Lottery Scheduling: Flexible Proportional-Share Resource Management

(1) Lottery scheduling is a novel mechanism in order to solve starvation problem in existing priority-based scheduling schemes. Lottery scheduling is consisted two objects: ticket and currency. The local currency can convert to base currency through these objects. Also, lottery scheduling ensures client's resource consumption according to the proportion allocated through the compensation ticket.

(2)

(+): no starvation, can control the resource consumption rate

(-): one malicious client can monopolize resources as a number of lottery tickets by ticket inflation

(3) I think list-based lottery and tree-based lottery manage time (search time, insert time, remove time) can optimize for other schemes.

e.g.) red-black tree, hash