

# 第39 - 40讲 虚拟存储管理的 页面清除与负载控制策略



# Basic Replacement Algorithms

## ➤ Page Buffering ( 页面缓冲 )

- Replaced page is added to one of two lists
  - free page list if page has not been modified
  - modified page list



# Cleaning Policy (清除策略)

**解决的基本问题：**

**系统应当在何时把一个已修改的页面写回辅存**

**?**



# Cleaning Policy

## ➤ Demand cleaning

- a page is written out only when it has been selected for replacement

## ➤ Precleaning

- pages are written out in batches

# Cleaning Policy

- **Best approach uses page buffering.**
  - **Replaced pages are placed in two lists.**
    - **Modified and unmodified.**
  - **Pages in the modified list are periodically written out in batches.**
  - **Pages in the unmodified list are either reclaimed if referenced again or lost when its frame is assigned to another page.**



# Load Control (负载控制)

- **Determines the number of processes that will be resident in main memory.**
- **Too few processes, many occasions when all processes will be blocked and much time will be spent in swapping.**
- **Too many processes will lead to thrashing.**

# Load Control

- 工作集方法、 PFF 算法等蕴涵着负载控制。
- L=S 准则：
  - 如果发生页面失败的平均时间等于处理页面失败的平均时间，那么 CPU 的利用率将达到最大。
- 50% 准则：
  - 如果分页设施的利用率保持在 50% 左右，那么 CPU 的利用率将达到最大。



# Load Control

- 如果系统使用全局置换策略以及 CLOCK 置换算法，那么系统可以通过监视扫描指针的移动速率来调整系统负载：
- 若扫描指针的移动速率低于某个给定的阈值，那么意味着近期页面失败的次数较少或者近期没有被引用的页面数较多；此时，系统可以放心地增加驻留内存的活动进程数。
  - 若扫描指针的移动速率超出某个给定的阈值，那么意味着近期页面失败的次数较多或者近期没有被引用的页面数较少；此时，系统应当减少驻留内存的活动进程数。





# Process Suspension

- **Lowest priority process.**
- **Faulting process**
  - this process does not have its working set in main memory so it will be blocked anyway.
- **Last process activated**
  - this process is least likely to have its working set resident.



# Process Suspension

- **Process with smallest resident set**
  - this process requires the least future effort to reload.
- **Largest process**
  - obtains the most free frames .
- **Process with the largest remaining execution window.**



# Examples of OS

- **UNIX and Solaris Memory Management :  
Paging System.**
- **Linux Memory Management : Page directory  
, Page middle directory (页间目  
录) , Page table.**
- **Windows 2000 Memory Management :  
W2K Paging.**





# Thank You !

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