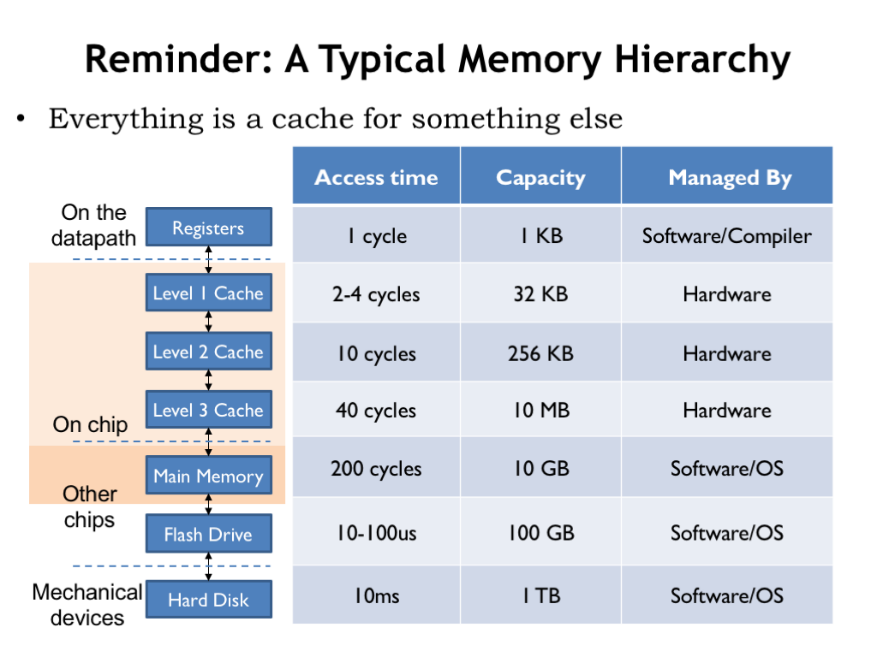
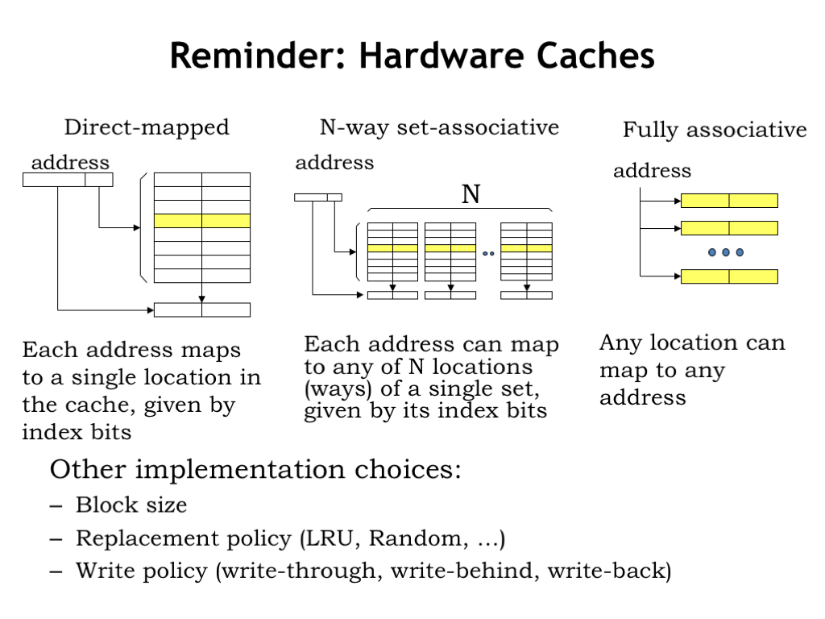
# 课件

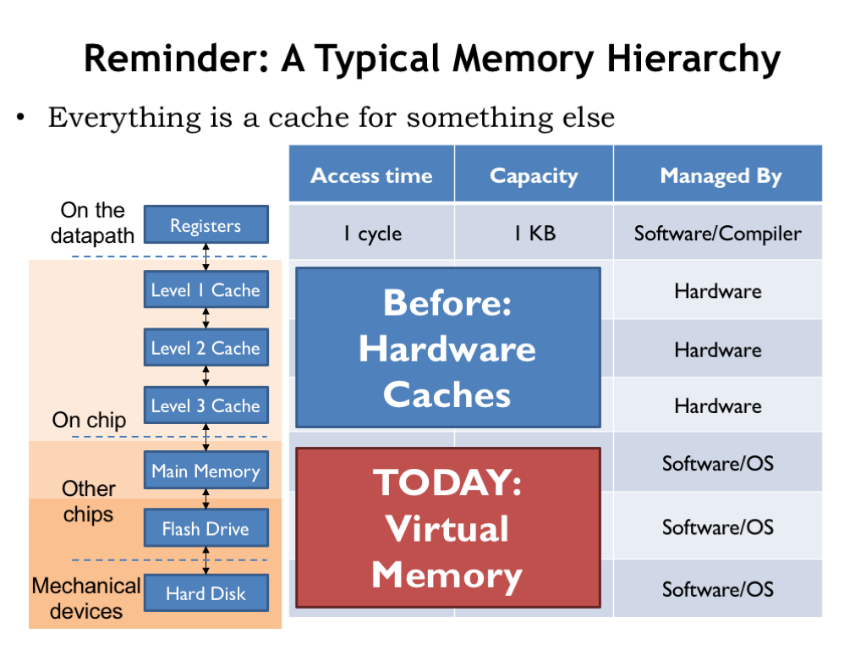
## 回顾：一个典型的内存分级



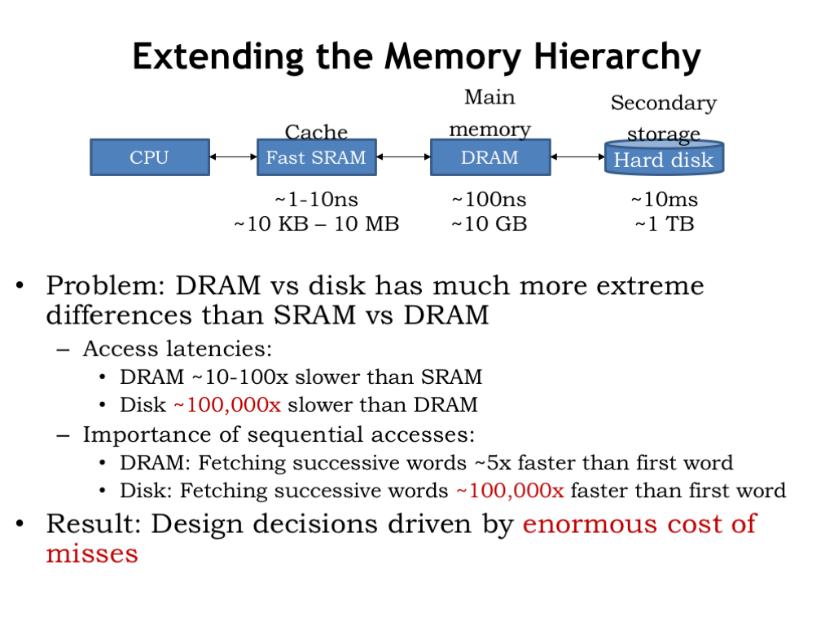
## 回顾：硬件缓存



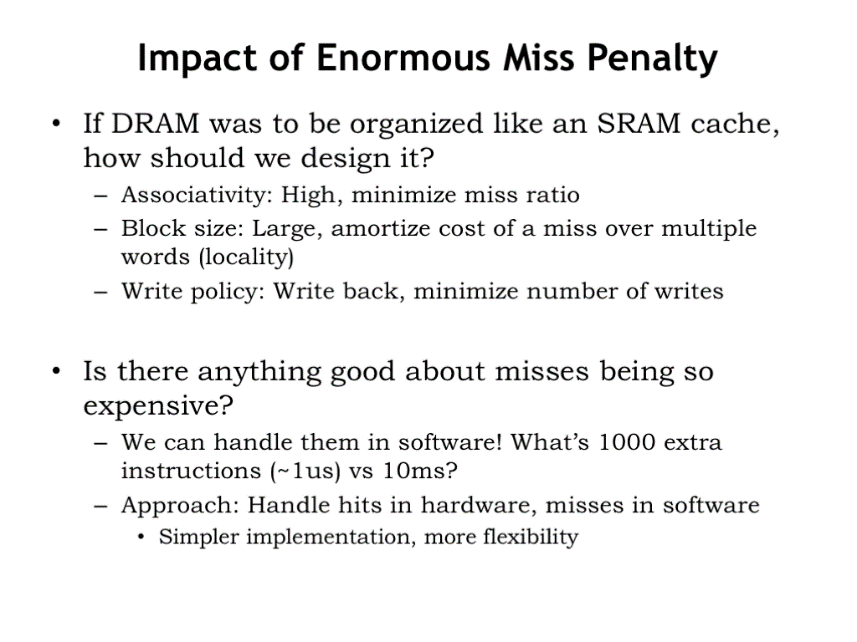
## 回顾：一个典型的内存分级



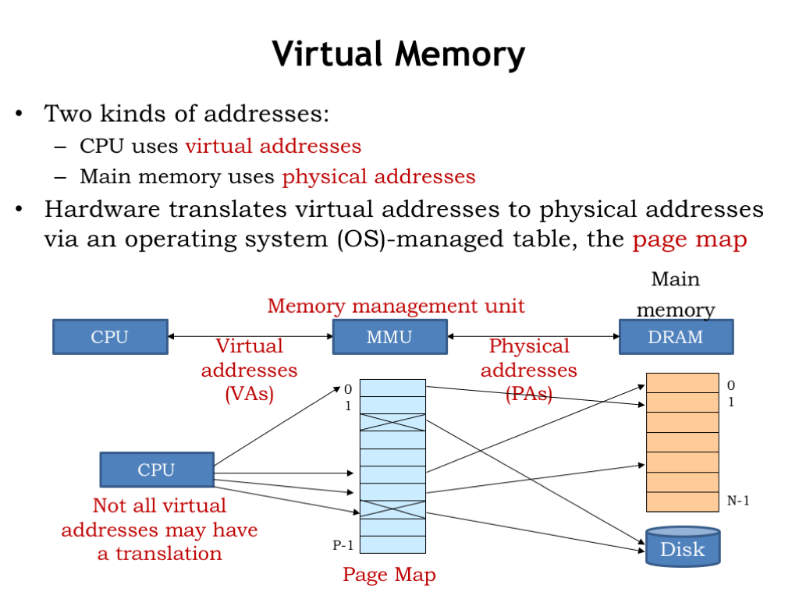
## 拓展内存分级



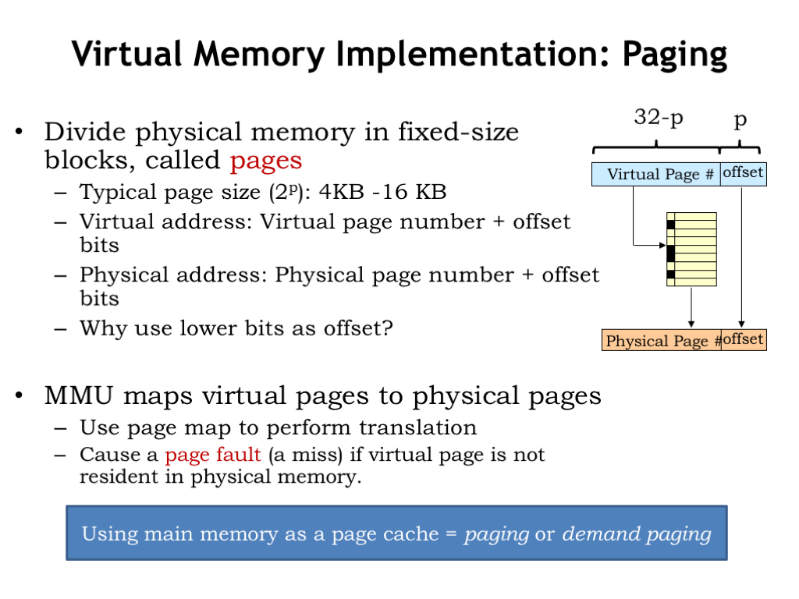
## 巨大的未命中处罚造成的影响



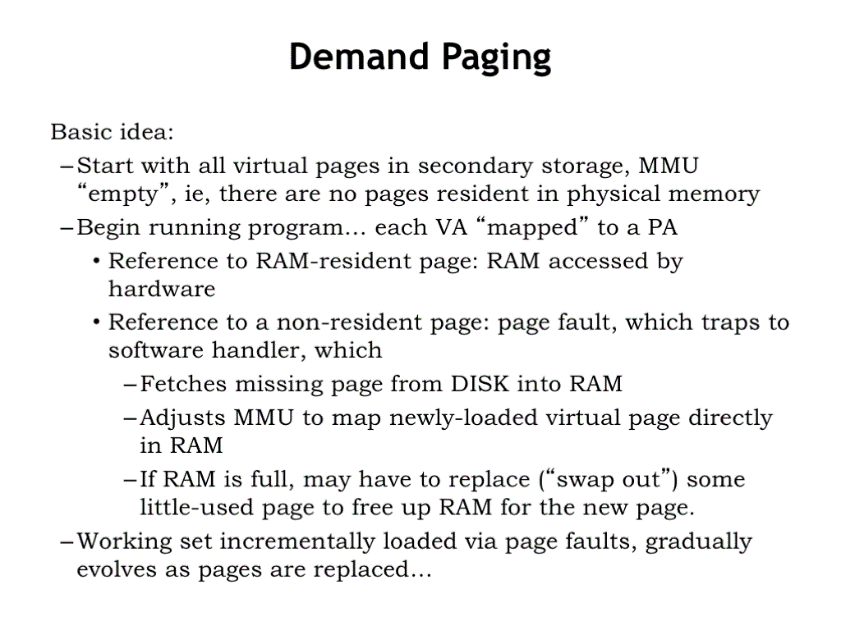
## 虚拟内存



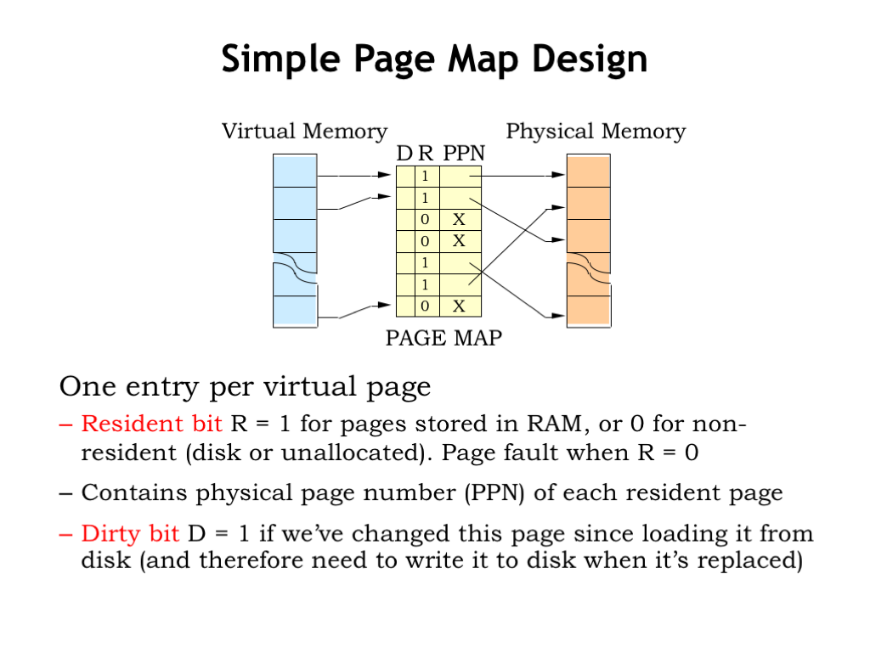
## 虚拟内存实现：分页



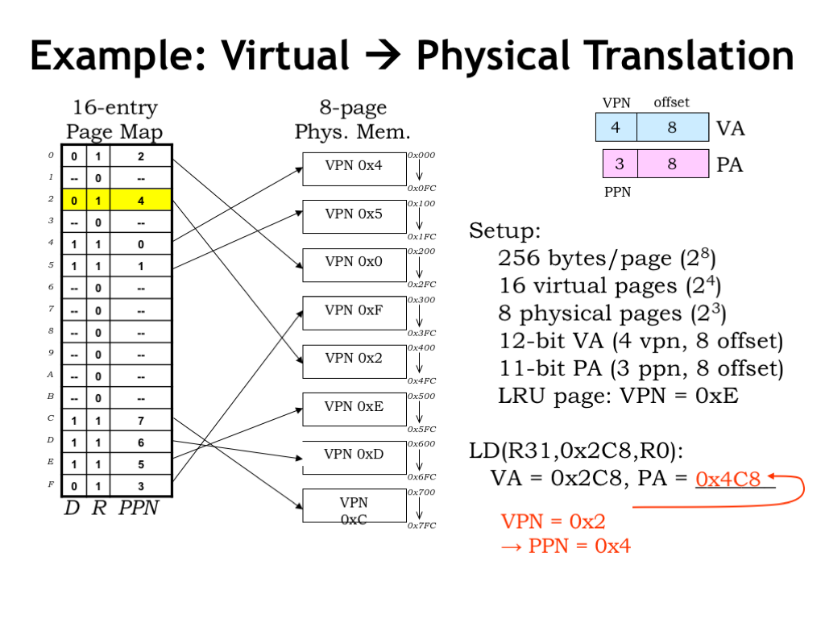
## 按需分页



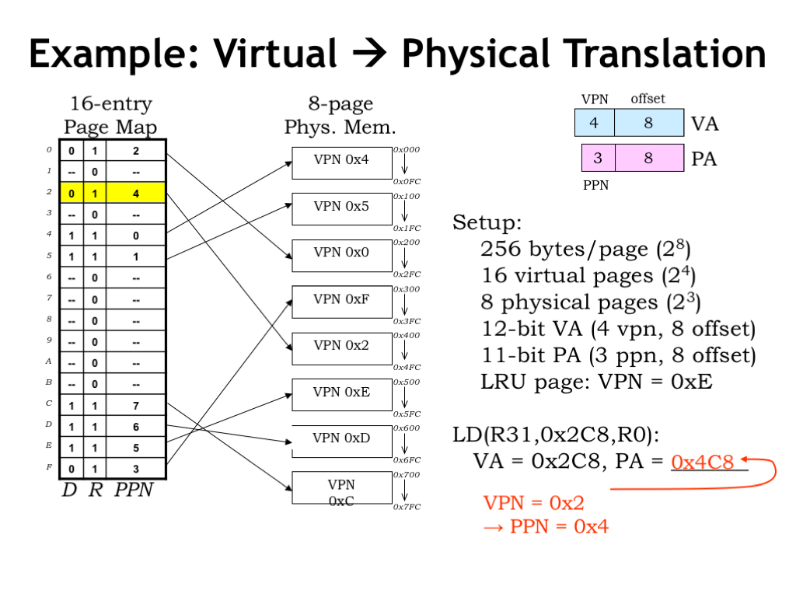
## 简单页映射设计



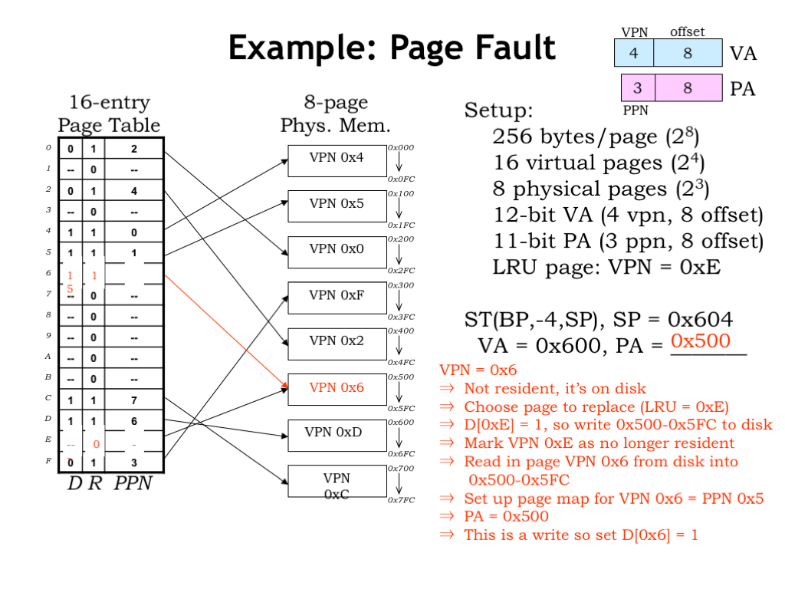
## 例子：虚拟->物理翻译



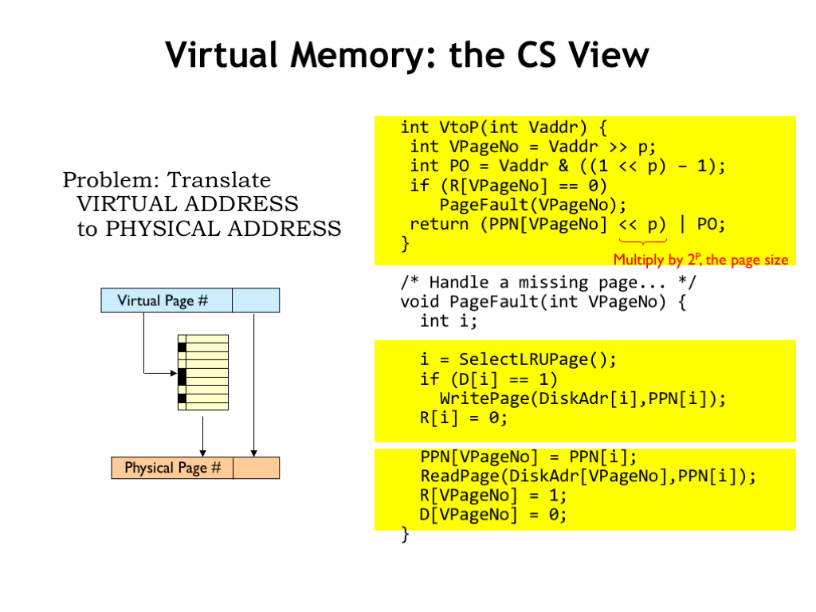
## 缺页



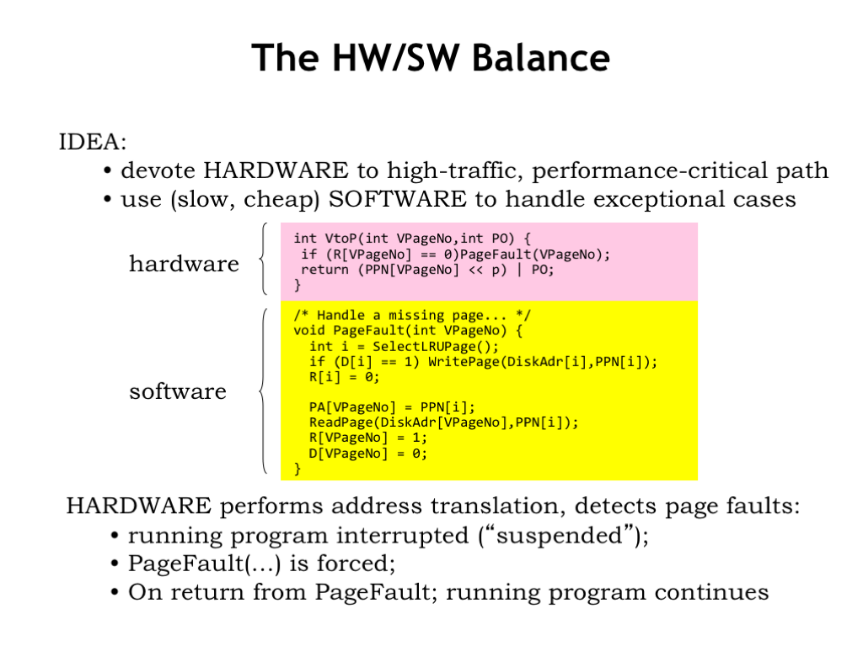
## 例子：缺页



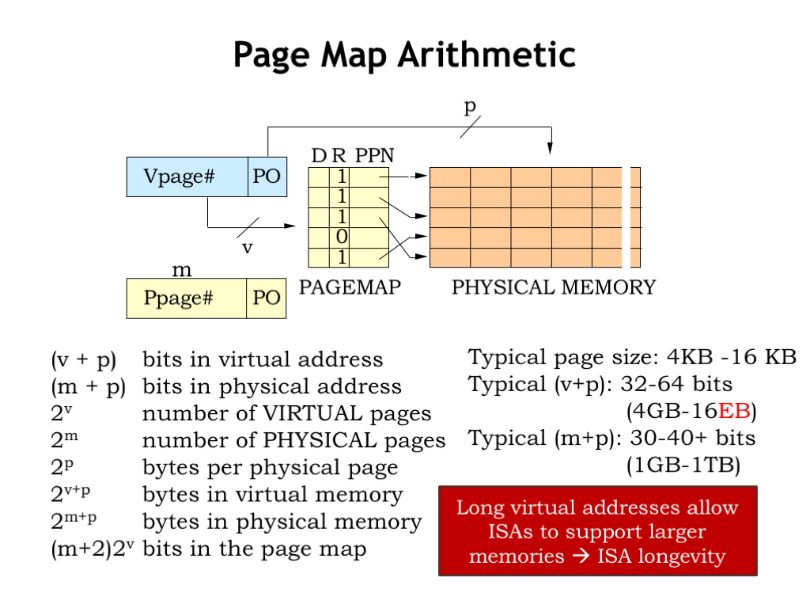
## 虚拟内存：CS视角



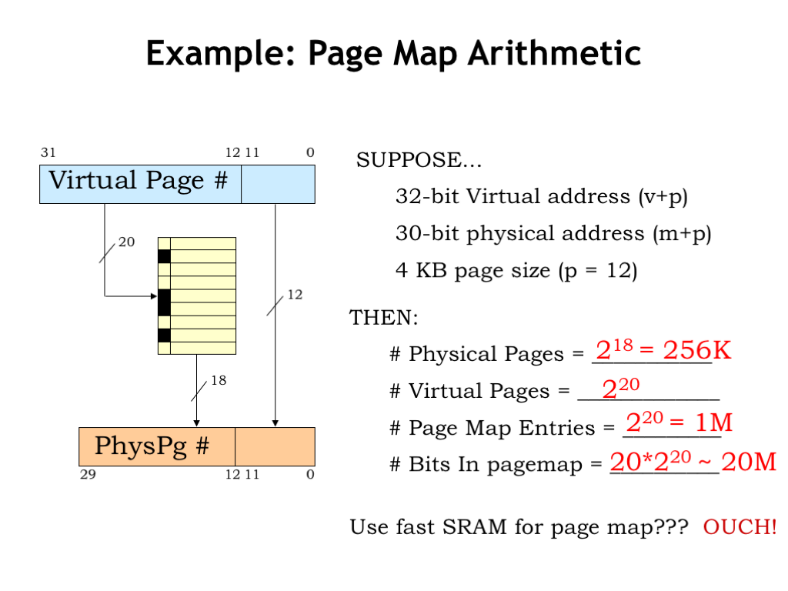
## 硬件/软件的平衡



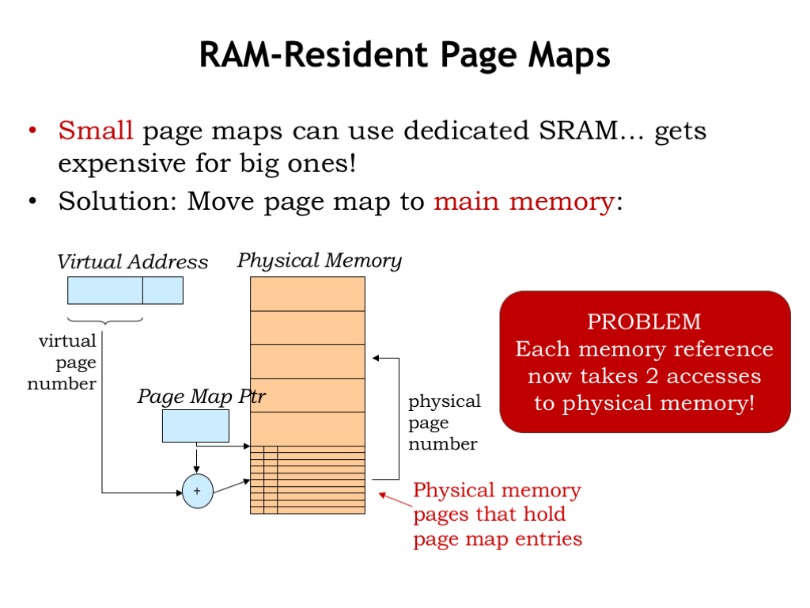
## 分页映射计算



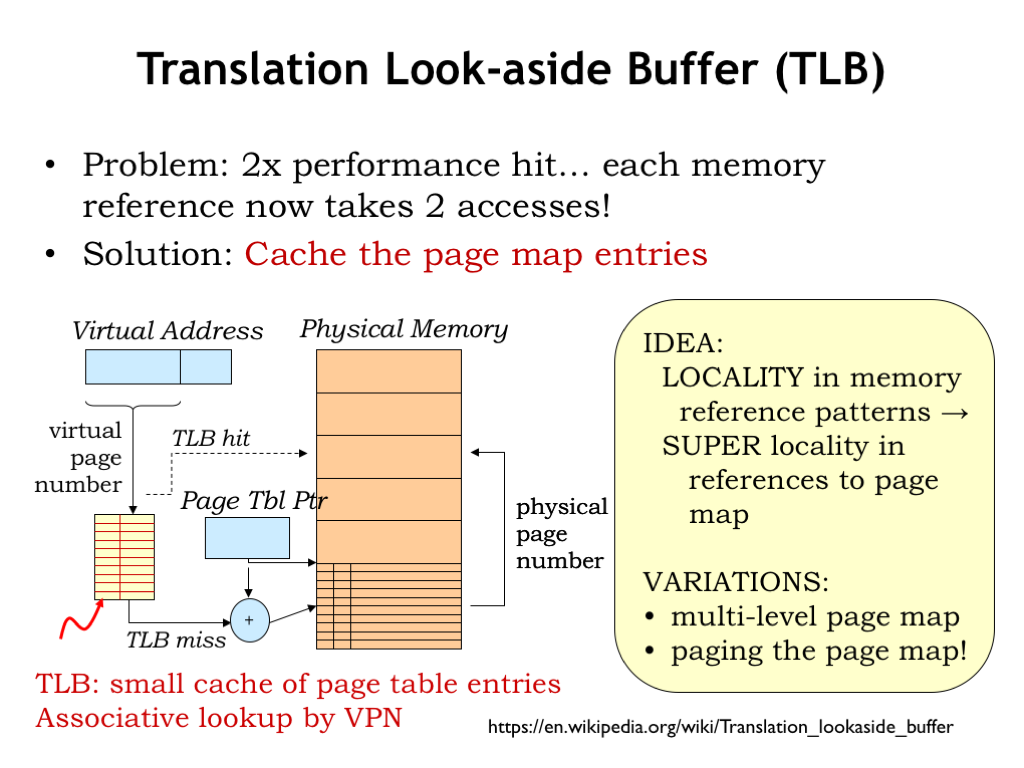
## 例子：分页映射计算



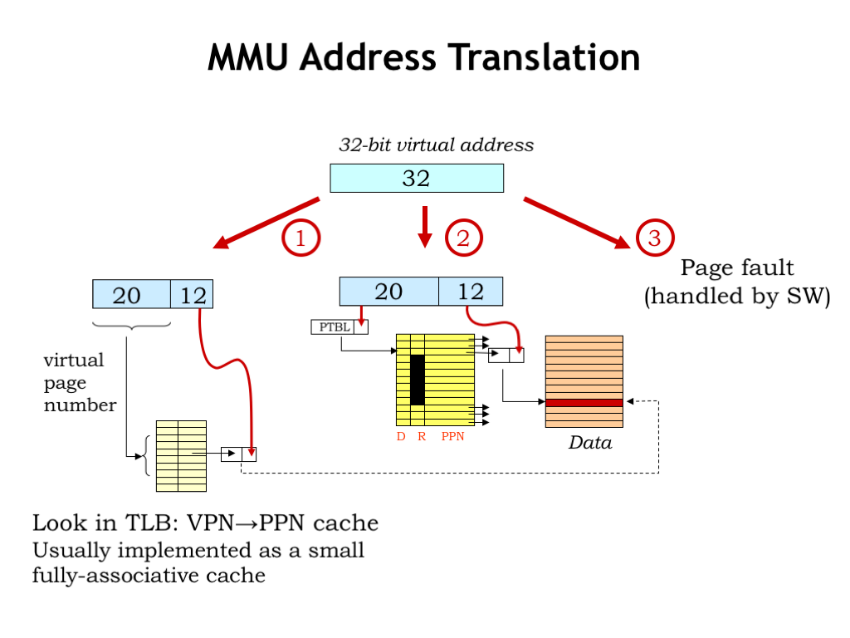
## RAM放置页映射



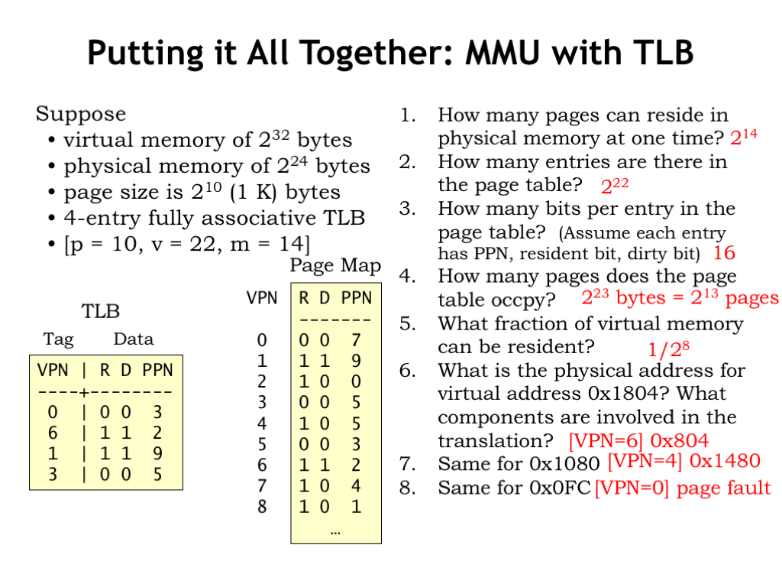
## 旁路翻译缓存（TLB）



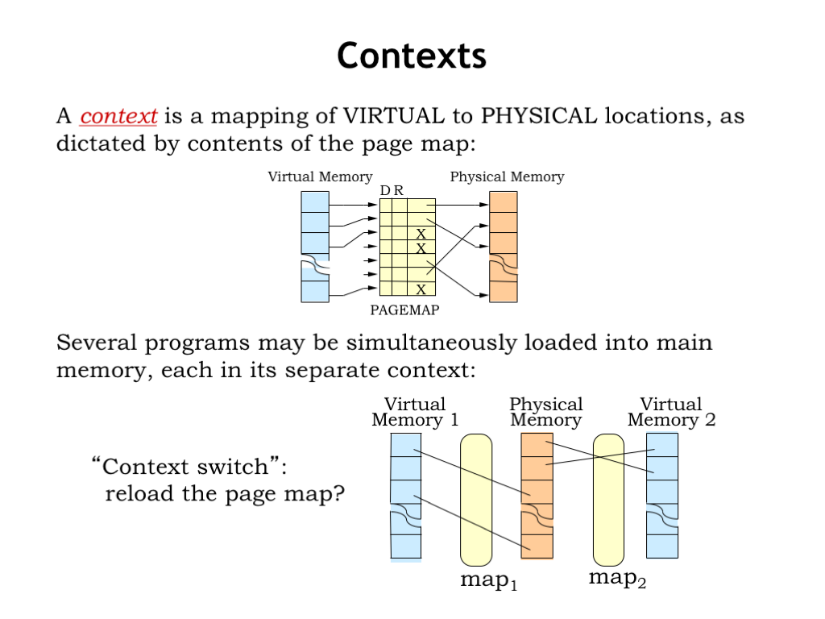
## MMU地址翻译



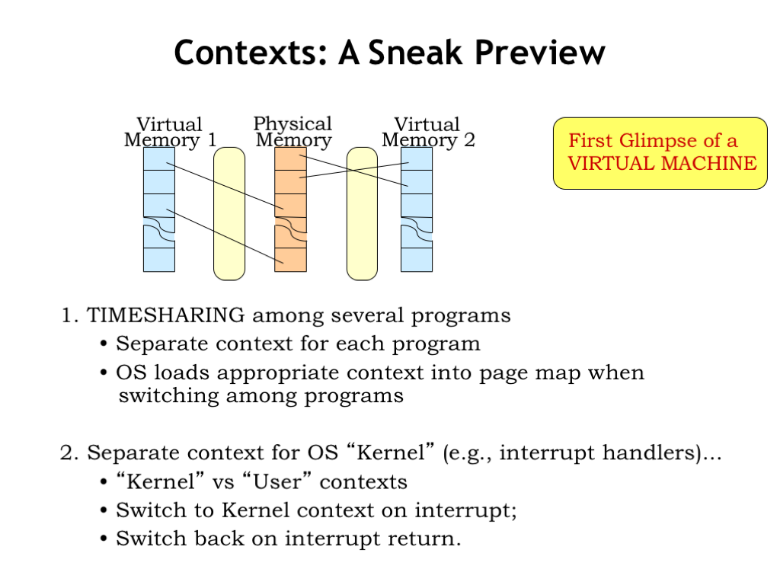
## 把它们放到一起：MMU + TLB



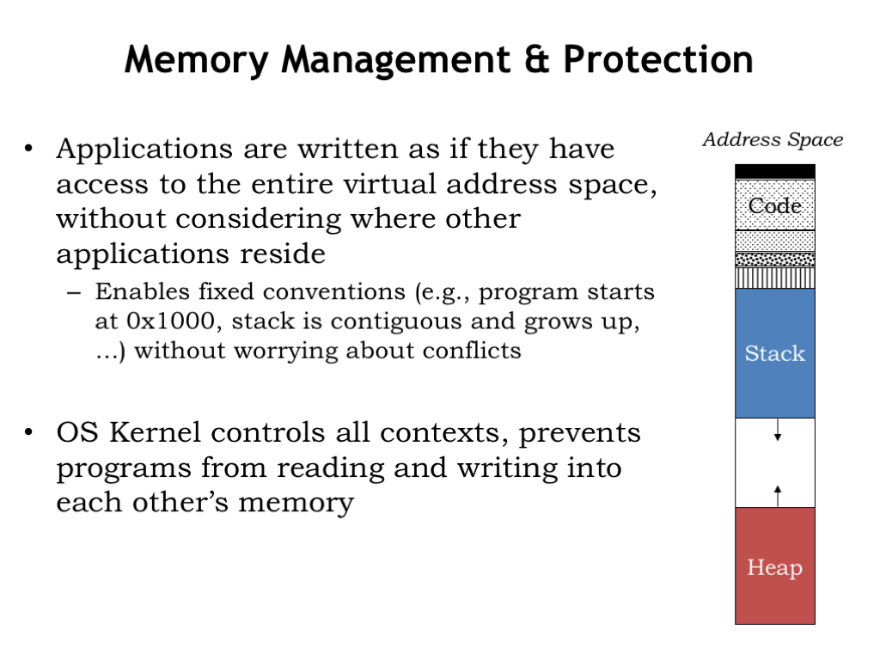
## 上下文



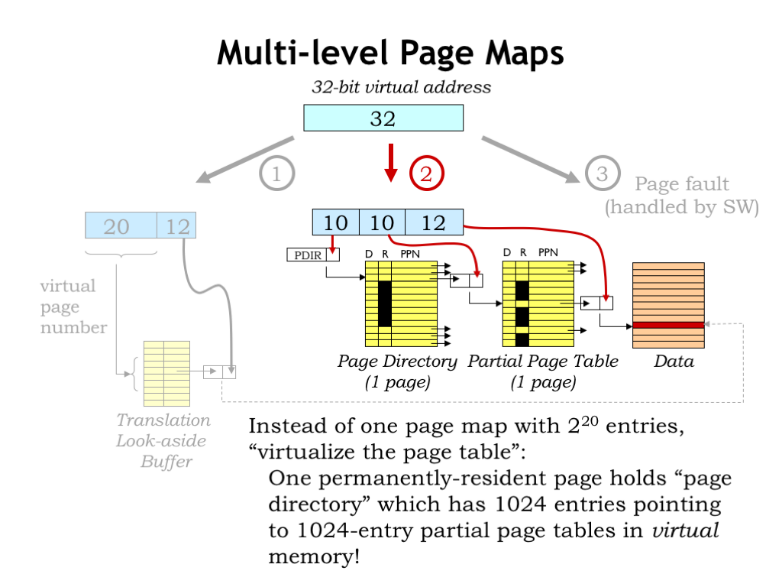
## 上下文：简单预览



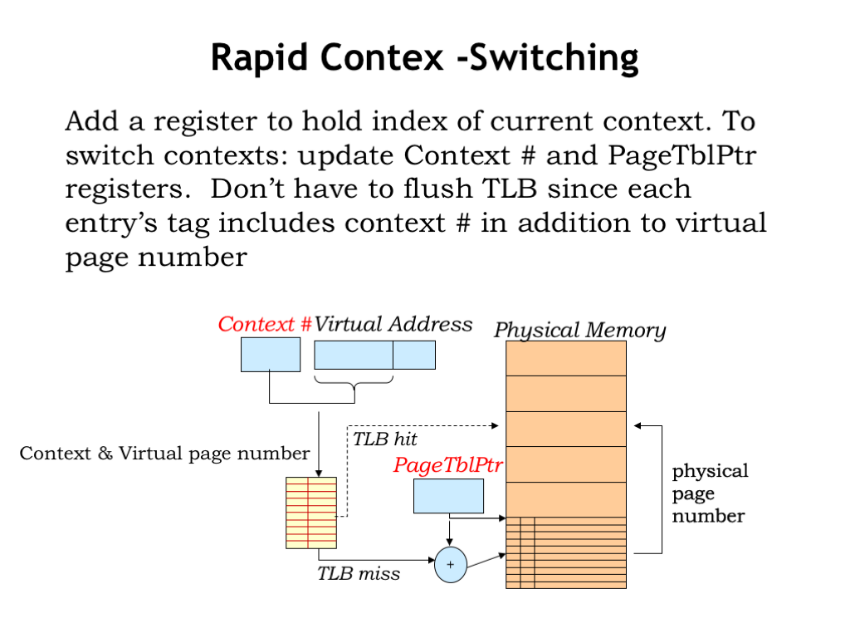
## 内存关联和保护



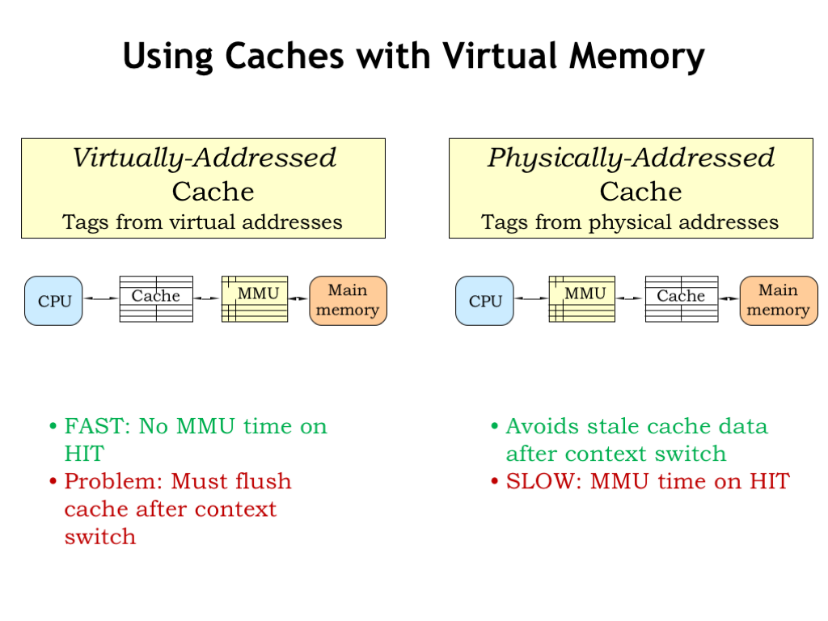
## 多级页映射



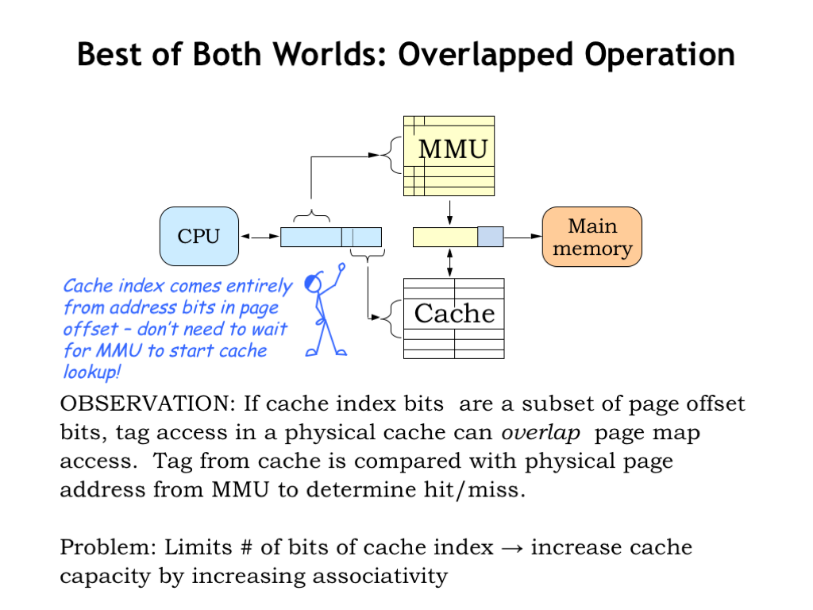
## 快速上下文切换



## 对虚拟内存使用缓存



## 两者兼顾：同时操作



## 总结：虚拟内存

