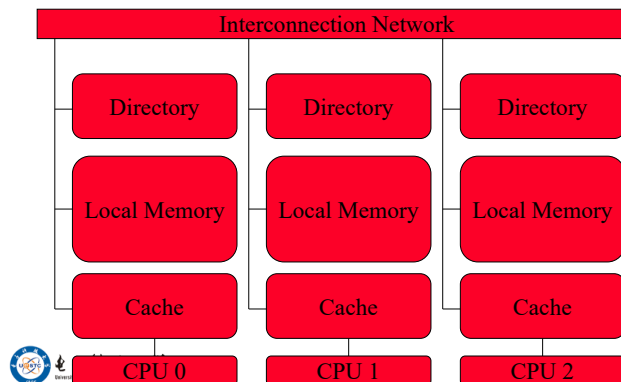


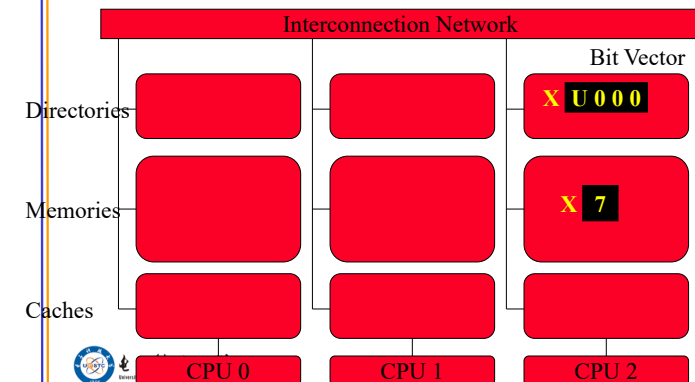
Sharing Status

- Uncached -- (用“U”表示)
 - 不在任何处理器的缓存中的块
- Shared – (用“S”表示)
 - 由一个或多个处理器缓存
 - 只读
- Exclusive – (用“E”表示)
 - 恰好由一个处理器缓存
 - 处理器已经写入块中
 - 内存中的拷贝已经过时

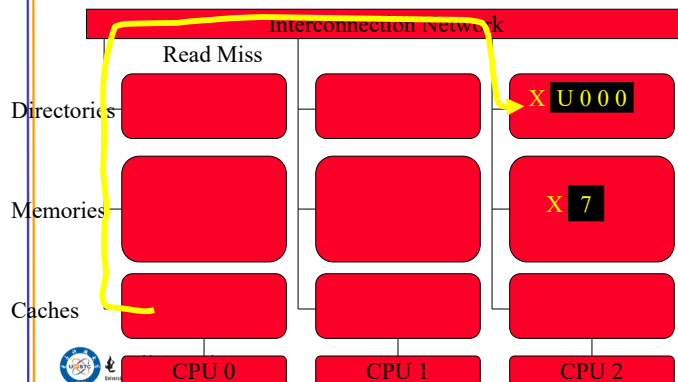
Directory-based Protocol - step 1



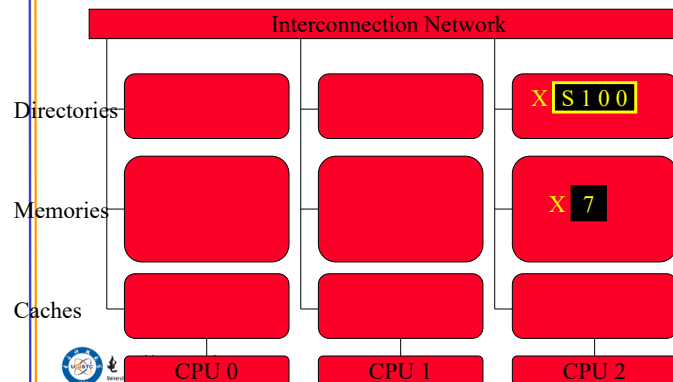
X has value 7 – step 2



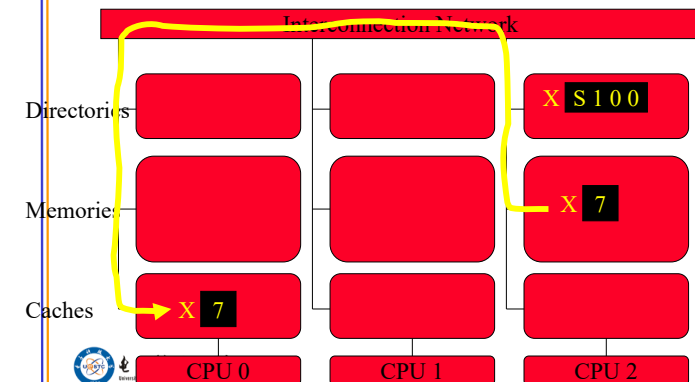
CPU 0 Reads X – step 3



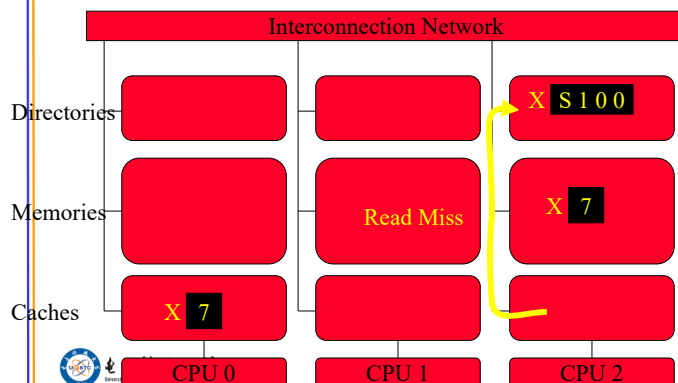
CPU 0 Reads X –step 4



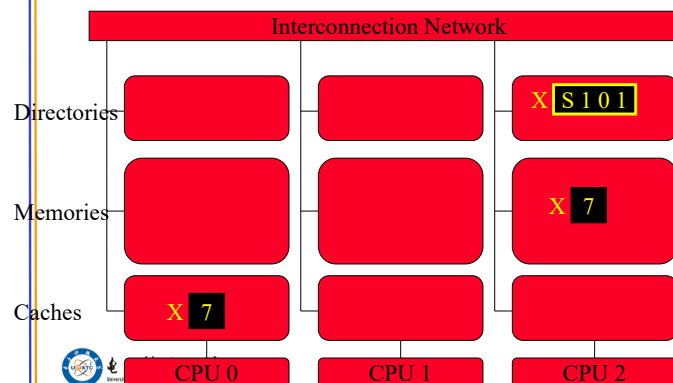
CPU 0 Reads X –step 5



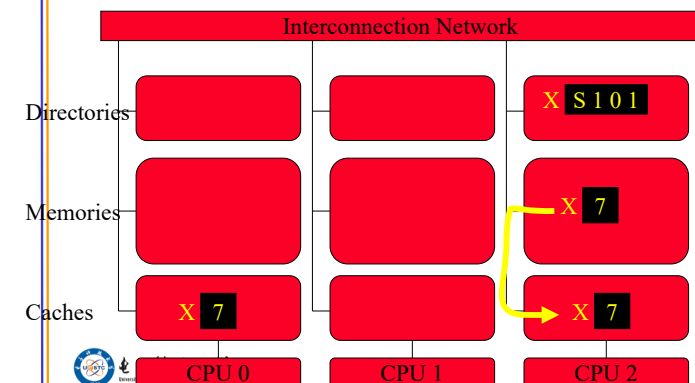
CPU 2 Reads X – step 6



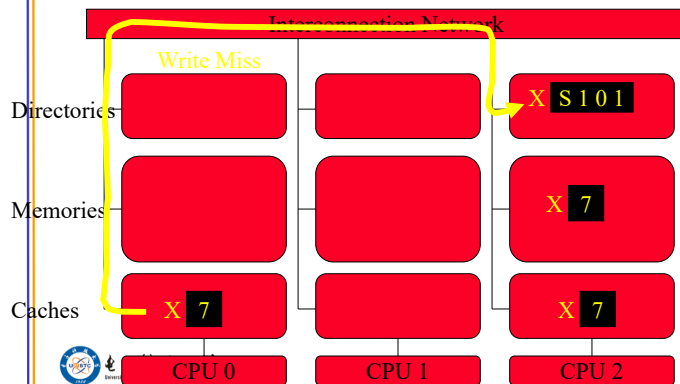
CPU 2 Reads X – step 7



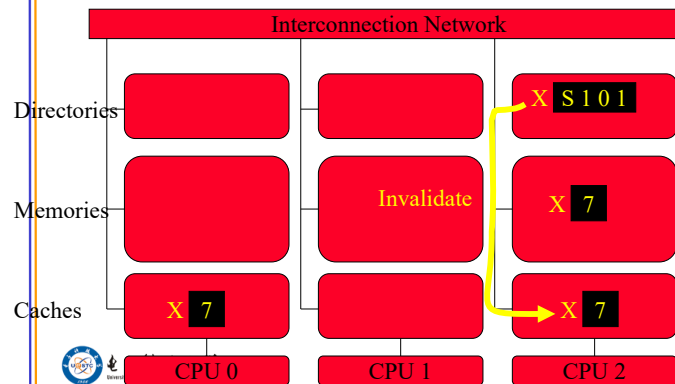
CPU 2 Reads X – step 8



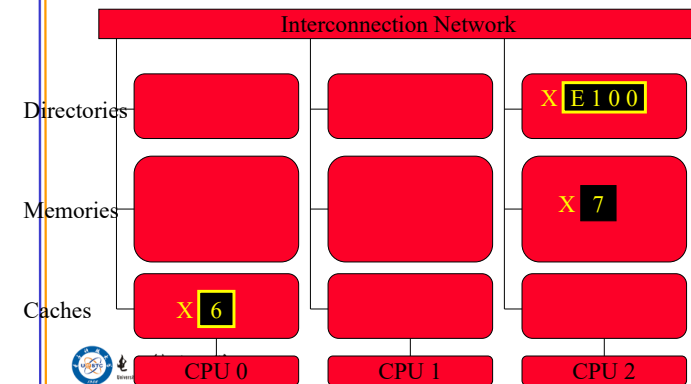
CPU 0 Writes 6 to X – step 9



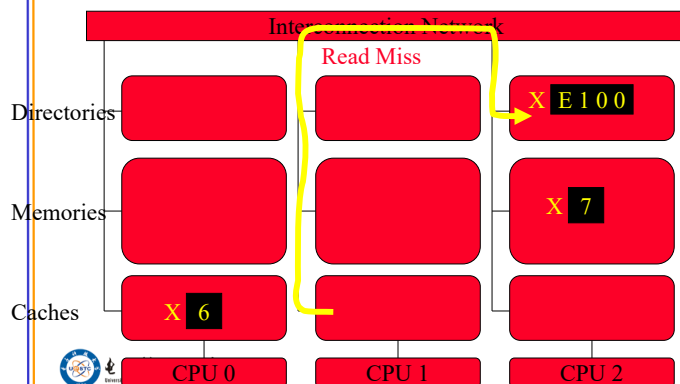
CPU 0 Writes 6 to X – step 10



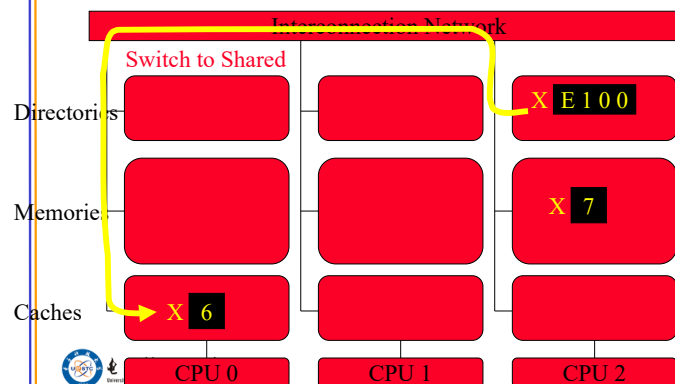
CPU 0 Writes 6 to X – step 11



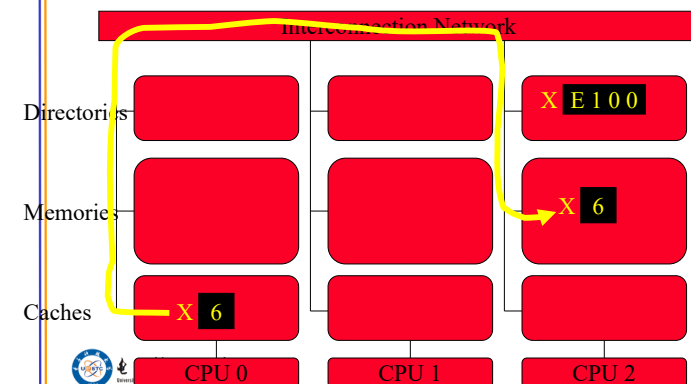
CPU 1 Reads X – step 12



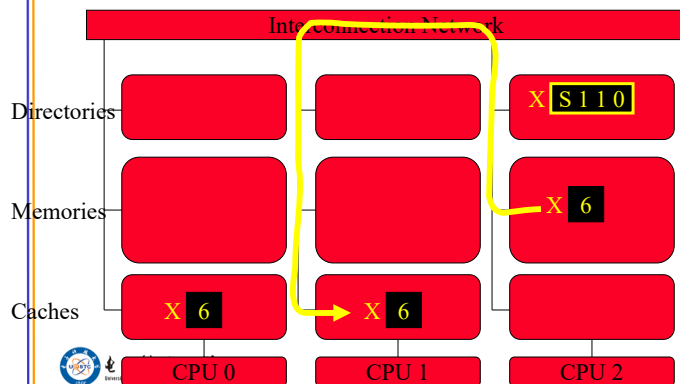
CPU 1 Reads X – step 13



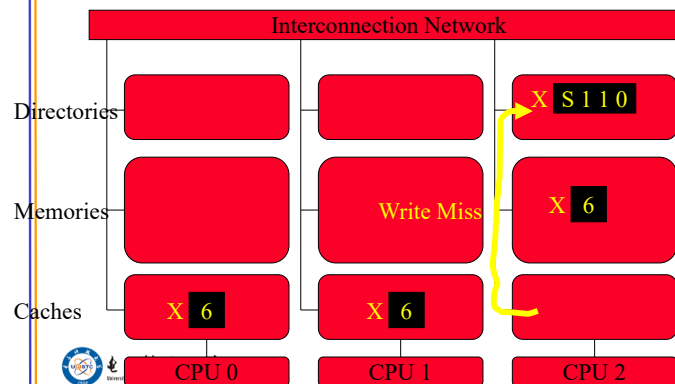
CPU 1 Reads X – step 14



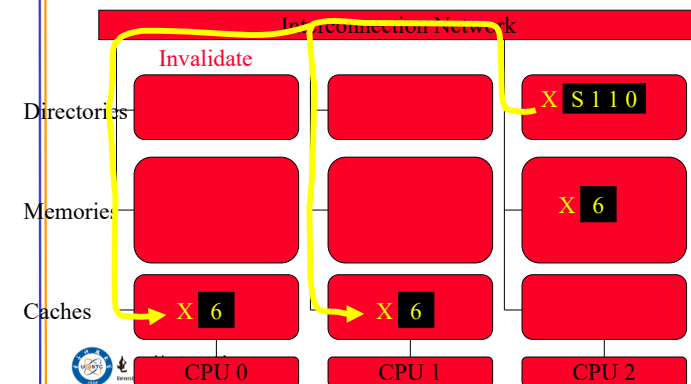
CPU 1 Reads X – step 15



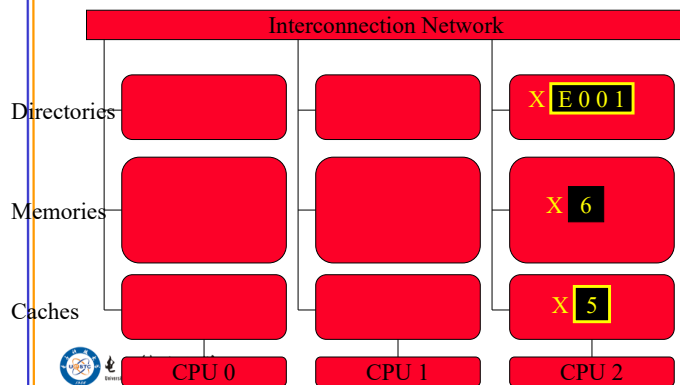
CPU 2 Writes 5 to X – step 16



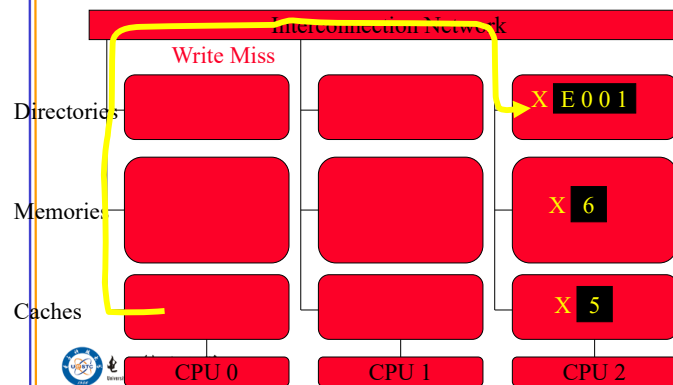
CPU 2 Writes 5 to X - step 17



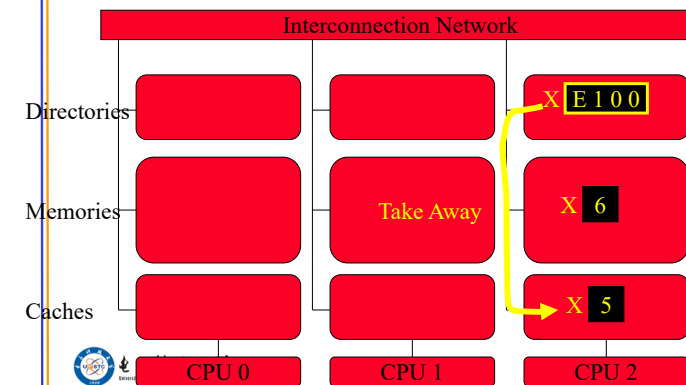
CPU 2 Writes 5 to X – step 18



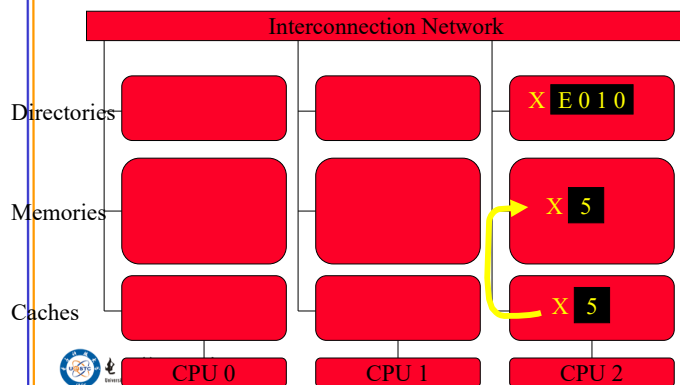
CPU 0 Writes 4 to X – step 19



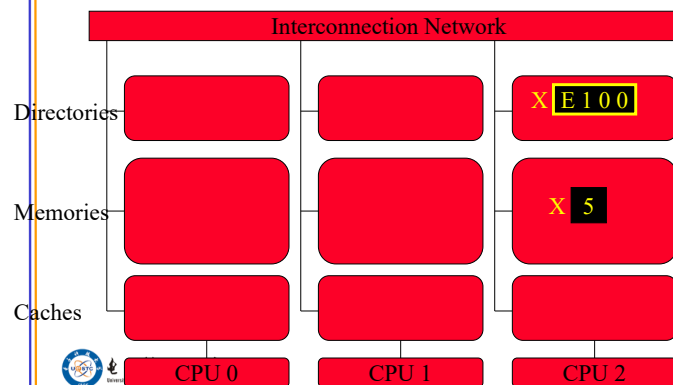
CPU 0 Writes 4 to X – step 20



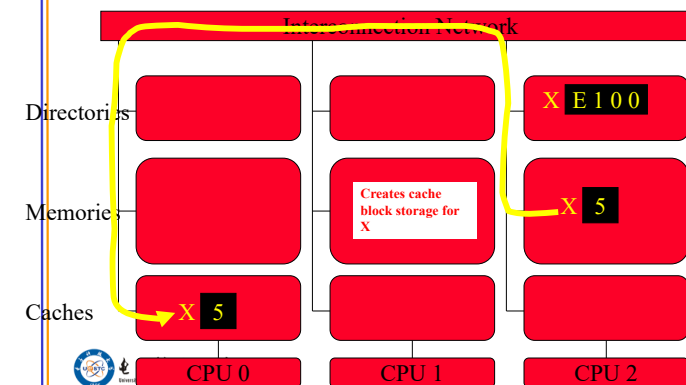
CPU 0 Writes 4 to X – step 21



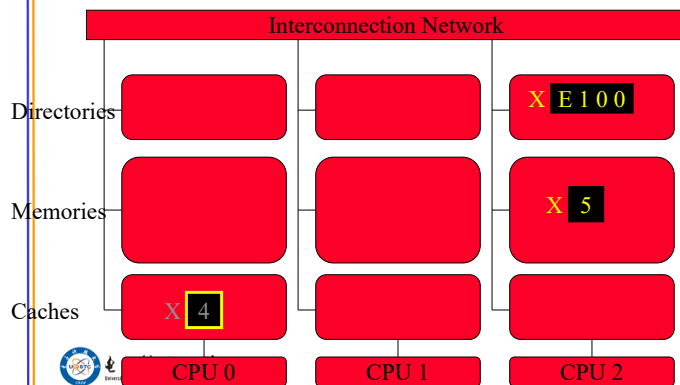
CPU 0 Writes 4 to X – step 22



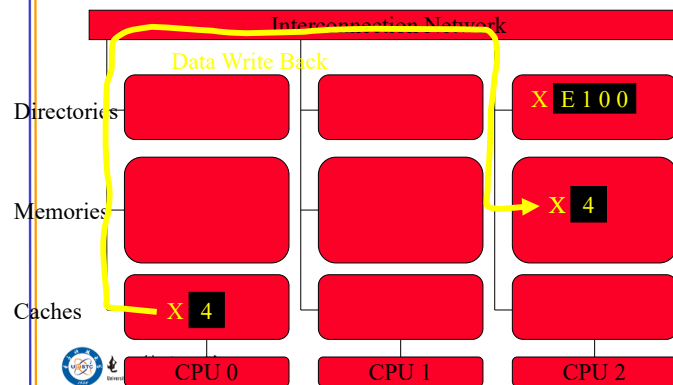
CPU 0 Writes 4 to X – step 23



CPU 0 Writes 4 to X – step 24



CPU 0 Writes Back X Block – step 25



CPU 0 flushes cache block X step 26

