

**More slides**

## **Soft Interrupts**

- **Like hardware interrupts**
- **Happen immediately**
- **Flag to say don't switch**
- **Less needed?**

## Interrupts

- **No SPLs**
- **No ipending**
- **Hardware interrupts are really prioritized**
- **Sharing breaks prioritization**
- **Priority may still keep thread from running**
- **Borrowed context means it can run on another process**
- **Priority inversion in relation to another processor can occur**

## Read path locks

- **0 syscall()**
- **1 read()**
- **2 vn\_read()**
- **3 VOP\_LEASE**
  - **NFS\_LOCK()** layering problem
  - **NFS\_UNLOCK()** no really needed
- **4 VOP\_GETATTR/ufs\_getattr**
  - **acquire vnode interlock**
  - **release vnode interlock**
- **3 VOP\_LEASE (back to)**
  - **NFS\_LOCK()**
  - **NFS\_UNLOCK()**
- **2 vn\_read() (back to)**
- **3 vn\_lock()**
  - **acquire VI\_LOCK**
- **4 lockmanager(lock)**
  - **acquire lockmanager internal lock**
  - **release lockmanager internal lock**

- **3 vn\_lock() (back to)**
  - acquire **VI\_LOCK**
  - release vnode interlock
- **2 vn\_read() (back to)**
- **3 vnode\_pager\_read\_synch() no locks**
- **2 vn\_read() (back to)**
- **3 ufs\_read()**
- **4 bread()**
- **5 getblk()**
  - acquire buf hash mutex
  - **BUF\_LOCK()**
  - **BUF\_UNLOCK()**
  - release buf hash mutex
- **4 bread() (back to)**
- **3 ufs\_read() (back to)**
- **4 uiomove()**
- **3 ufs\_read() (back to)**
- **4 brelse**
  - acquire **bufq\_lru\_mtx**

- **release bufq\_lru\_mtx**
- **BUF\_LOCK()**
- **BUF\_UNLOCK()**
- **3 ufs\_read() (back to)**
  - **acquire vnode interlock**
  - **release vnode interlock**
- **2 vn\_read() (back to)**
  - **acquire file lock**
  - **release file lock**
- **3 lockmanager(unlock)**
  - **acquire lock manager internal lock**
  - **release lock manager internal lock**
- **2 vn\_read() (back to)**
- **1 read (back to)**
- **0 syscall (back to)**
  - **acquire proc lock**
  - **release proc lock**