Andrew Tran

HW2

1. 4 bit tag; 12 bit offset

4669 – page fault

2227 - page table hit

13916 – TLB hit

34587 – page fault

48870 – page table hit

12608 – TLB hit

49225 – page fault

TLB:

|  |  |  |
| --- | --- | --- |
| Valid | Tag | PPN |
| 1 | 12 | 15 |
| 1 | 8 | 14 |
| 1 | 3 | 6 |
| 1 | 11 | 12 |

Page Table:

|  |  |
| --- | --- |
| Valid | PPN |
| 1 | 5 |
| 1 | 13 |
| 0 | Disk |
| 1 | 6 |
| 1 | 9 |
| 1 | 11 |
| 0 | Disk |
| 1 | 4 |
| 1 | 14 |
| 0 | Disk |
| 1 | 3 |
| 1 | 12 |
| 1 | 15 |

1. 2 bit tag; 14 bit offset

4669 – Page table hit

2227 – TLB hit

13916 – TLB hit

3587 – Page fault

48870 – TLB hit

12608 – TLB hit

49225 – TLB hit

TLB:

|  |  |  |
| --- | --- | --- |
| Valid | Tag | PPN |
| 1 | 2 | 13 |
| 1 | 7 | 4 |
| 1 | 3 | 6 |
| 1 | 0 | 5 |

Page Table:

|  |  |
| --- | --- |
| Valid | PPN |
| 1 | 5 |
| 0 | Disk |
| 1 | 13 |
| 1 | 6 |
| 1 | 9 |
| 1 | 11 |
| 0 | Disk |
| 1 | 4 |
| 0 | Disk |
| 0 | Disk |
| 1 | 3 |
| 1 | 12 |
| 12 | Disk |

Pros: Smaller page table, more TLB hits, less page faults

Cons: More internal fragmentation

3)

TLB:

|  |  |  |
| --- | --- | --- |
| Set 0: |  |  |
| Valid | Tag | PPN |
| 1 | 6 | 13 |
| 1 | 4 | 9 |
| Set 1: |  |  |
| Valid | Tag | PPN |
| 1 | 3 | 6 |
| 1 | 1 | 13 |

4) 232 / 213 / 2= 262144 pages/app

262144 pages/app \* 5apps \* 4bytes/page = **5.24 MB**

5) Min: 256\*6B\*2 = **3.072KB** (only one page table)

Max: 256\*6B\*256 = **393.216KB** (All page tables allocated)