Warped-GATES

Gating Aware Scheduling and Power Gating for GPGPUs

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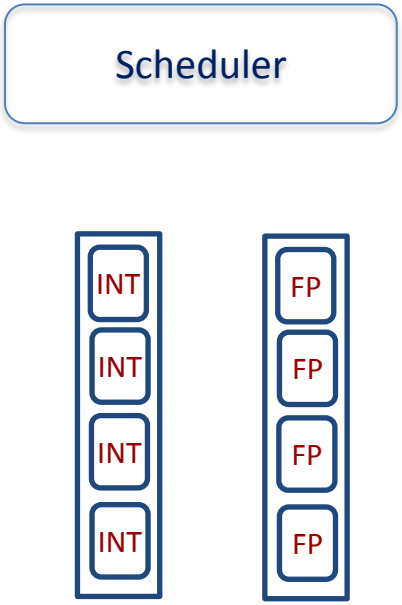
Power Gating Challenges in GPUs

- Scheduler greedily issues ready instructions
  - Agnostic to instruction type.



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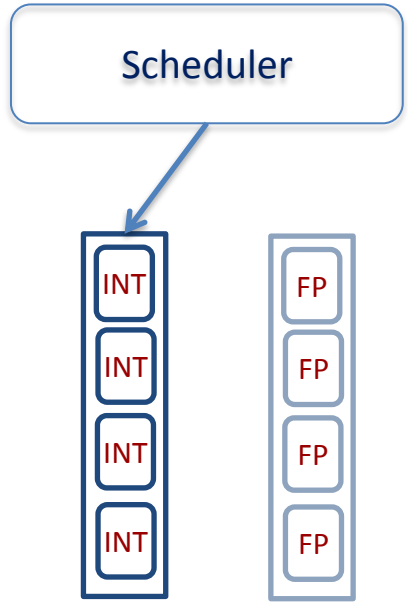

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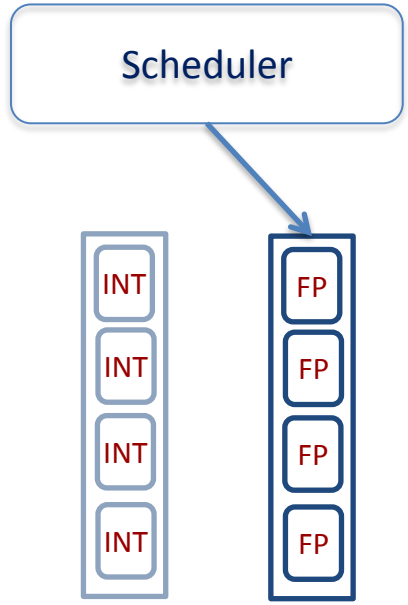

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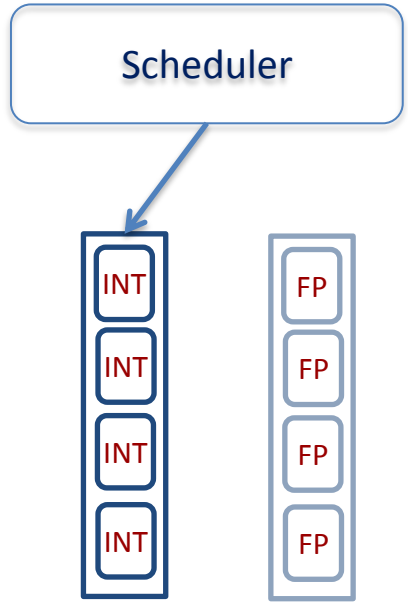

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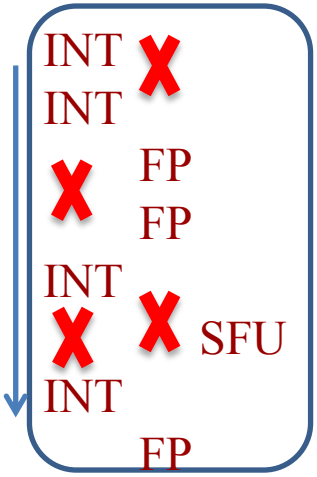

Proposed Techniques

- Gating Aware Scheduler (GATES)
  - Gives priority to same instruction type during scheduling.
  - Is able to increase the length of the idle periods.
  - **Idle periods are not long enough to avoid negative savings!!**
- Blackout technique
  - Eliminates negative savings by forcing the unit to stay in power gating state.

1.5X

Static Power Savings

<1%

Performance Overhead