Power Models in Graphite

Existing features and new features coming soon
Power Models

• Activity Counters track events
  – Total Dynamic Energy = Event Counter \( \times \) Dynamic Energy associated with each event
  – Total Static Energy = Completion Time \( \times \) Static Power associated with each component
Power Models

• In current release:
  – Network (using Orion)
  – Caches (using McPAT)

• Coming soon:
  – Cores (using McPAT)

• Future work:
  – DRAM
Network Power Modeling

• Modeling Tool:
  – “Orion: A Power-Performance Simulator for Interconnection Networks”
  – http://projects.csail.mit.edu/cgi-bin/wiki/view/LSPgroup/OrionPage

• Tracked Events:
  – Link Traversals
  – Router Buffer Reads/Writes
  – Router Switch Allocator Requests
  – Router Crossbar Traversals
Cache Power Modeling

• Modeling Tool:
  – http://www.hpl.hp.com/research/mcpat/

• Tracked Events:
  – Directory Cache Accesses
  – L1/L2 Cache Data Reads
  – L1/L2 Cache Data Writes
  – L1/L2 Cache Tag Accesses
Core Power Modeling

• **Modeling Tool:**

• **Example Events:**
  – Integer/Floating Point add
  – Integer/Floating Point subtract
  – Integer/Floating Point multiply
  – Integer/Floating Point divide
Power Models

• In current release:
  – Network (using Orion)
  – Caches (using McPAT)

• Coming soon:
  – Cores (using McPAT)

• Future work:
  – DRAM