

# Nested SVM - Performance Discussion

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# \$ whoami

- Joerg Roedel
- Work for AMD
- Projects: KVM and IOMMU

# State of Nested SVM

- Merged into the 2.6.31 Linux Kernel
- Significantly improved since then
  - Lots of bugs fixed
  - Performance improvements
  - Unit-Tests available
- The 2.6.37-rc1 Linux-Kernel has support for emulating the Nested Paging feature

# Supported Hypervisors

**KVM**

**Xen**

**VirtualBox**

**HyperV/VirtualPC**

**VMware**

# Nested SVM Costs

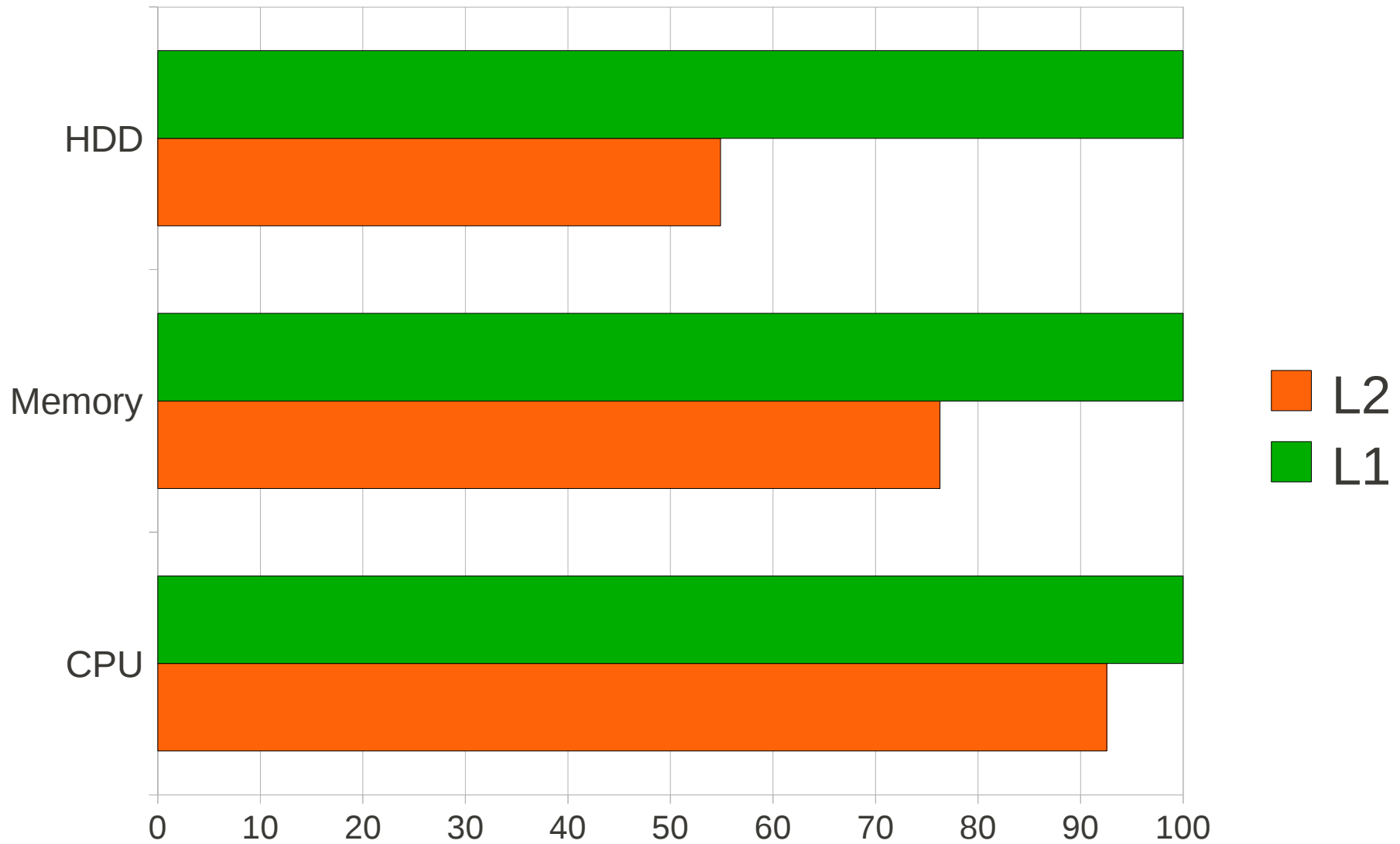
- SVM instructions are a lot of slower in emulation

<b>VMRUN/VMExit</b>	<b>~7000 cycles</b>
<b>VMLoad/VMSave</b>	<b>~ 2000 cycles each</b>
<b>STGI/CLGI</b>	<b>~ 1600 cycles each</b>

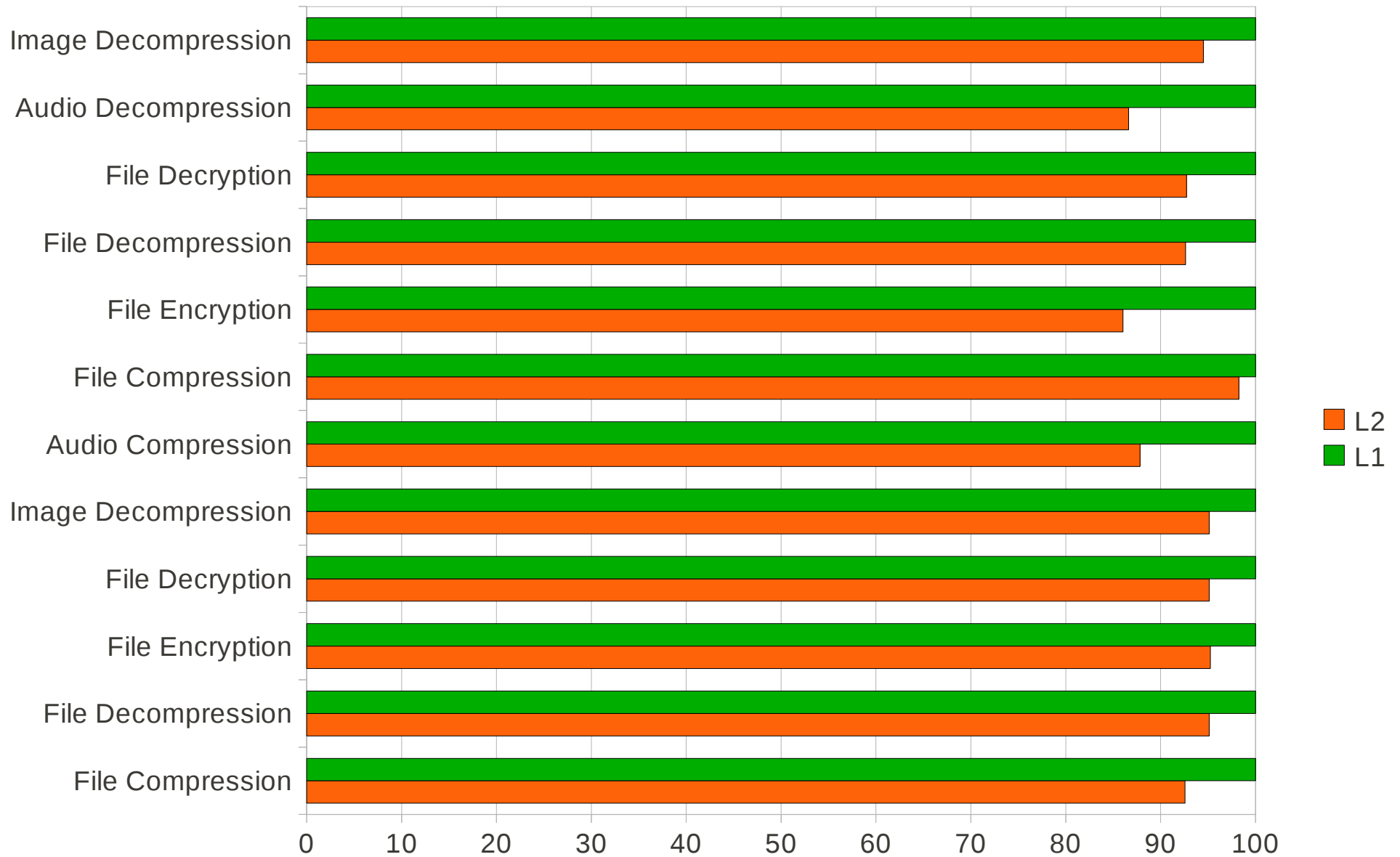
- This numbers are around 5-10 times higher than in the non-emulated case

And Now: The Real Benchmarks

# PCMark05 - Scores

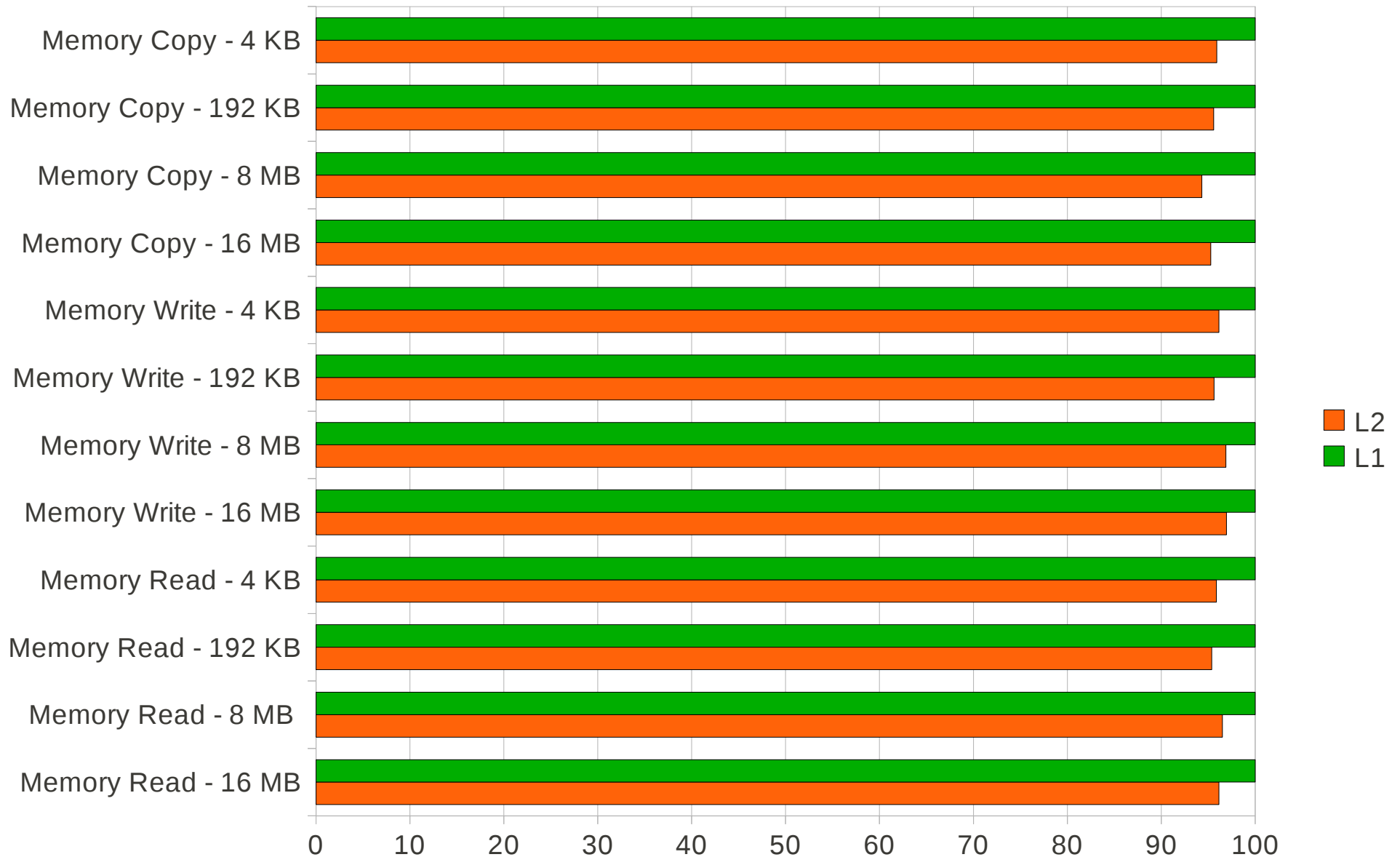


# PCMark05 – CPU Suite

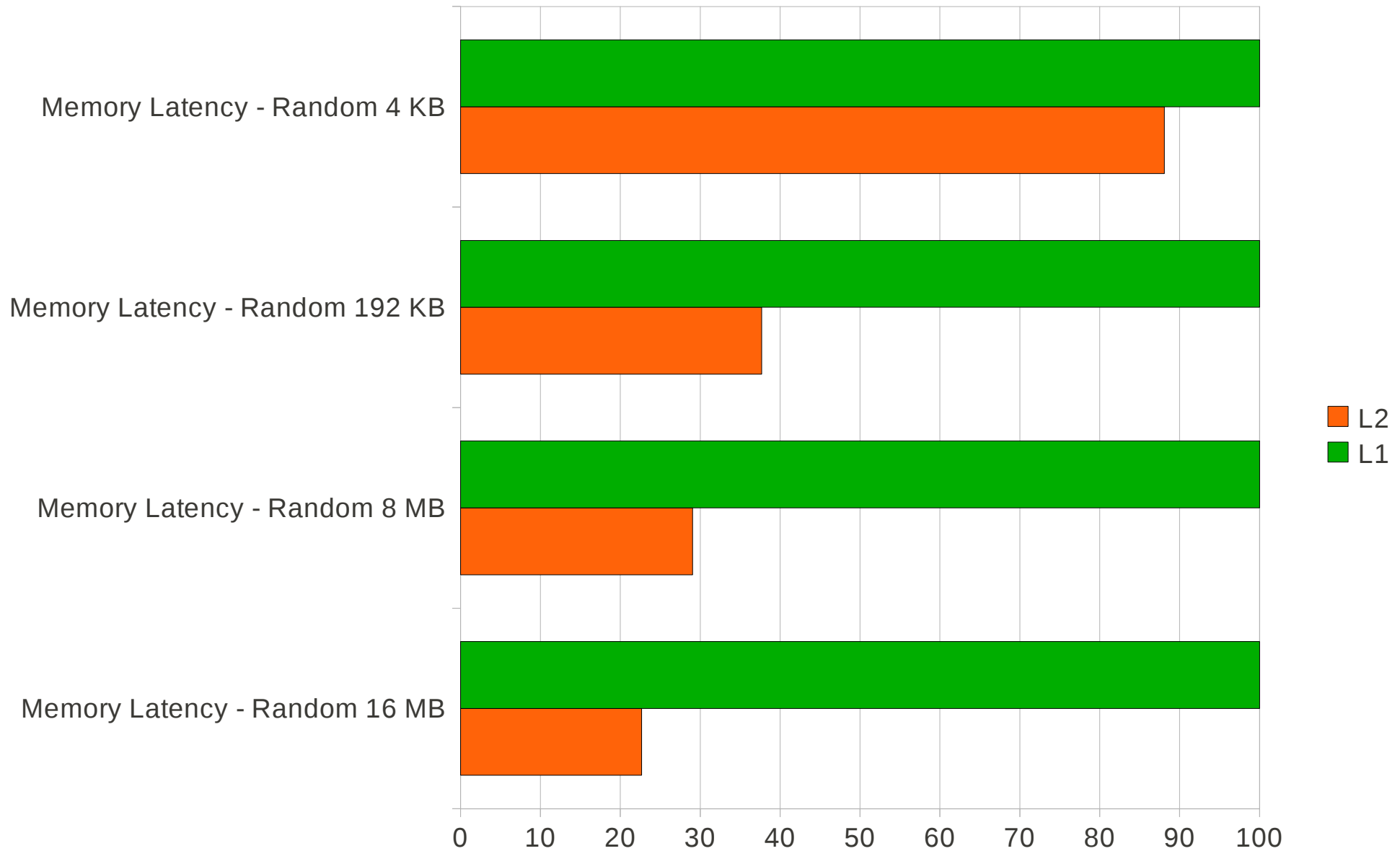




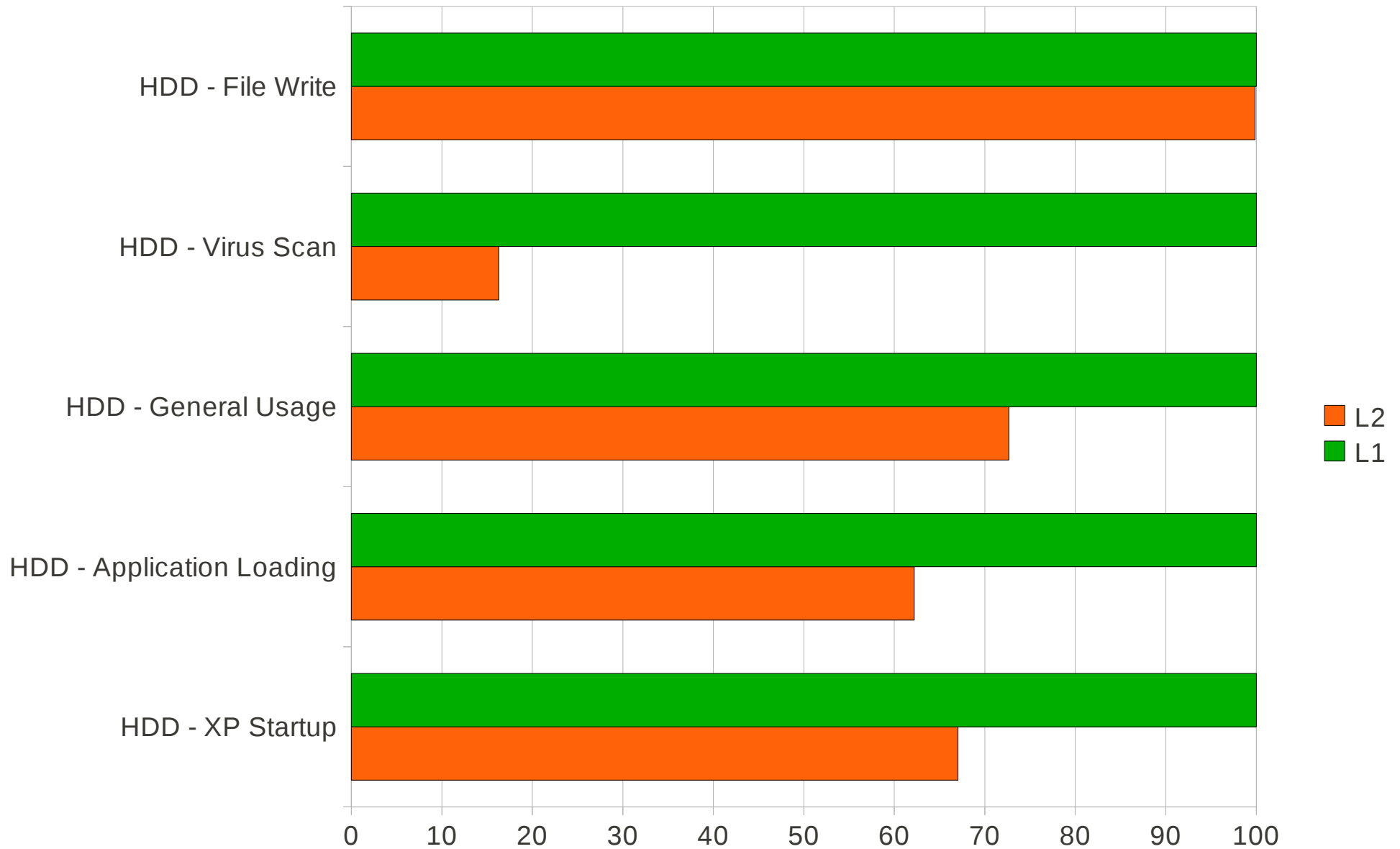
# PCMark05 – Memory Suite 1



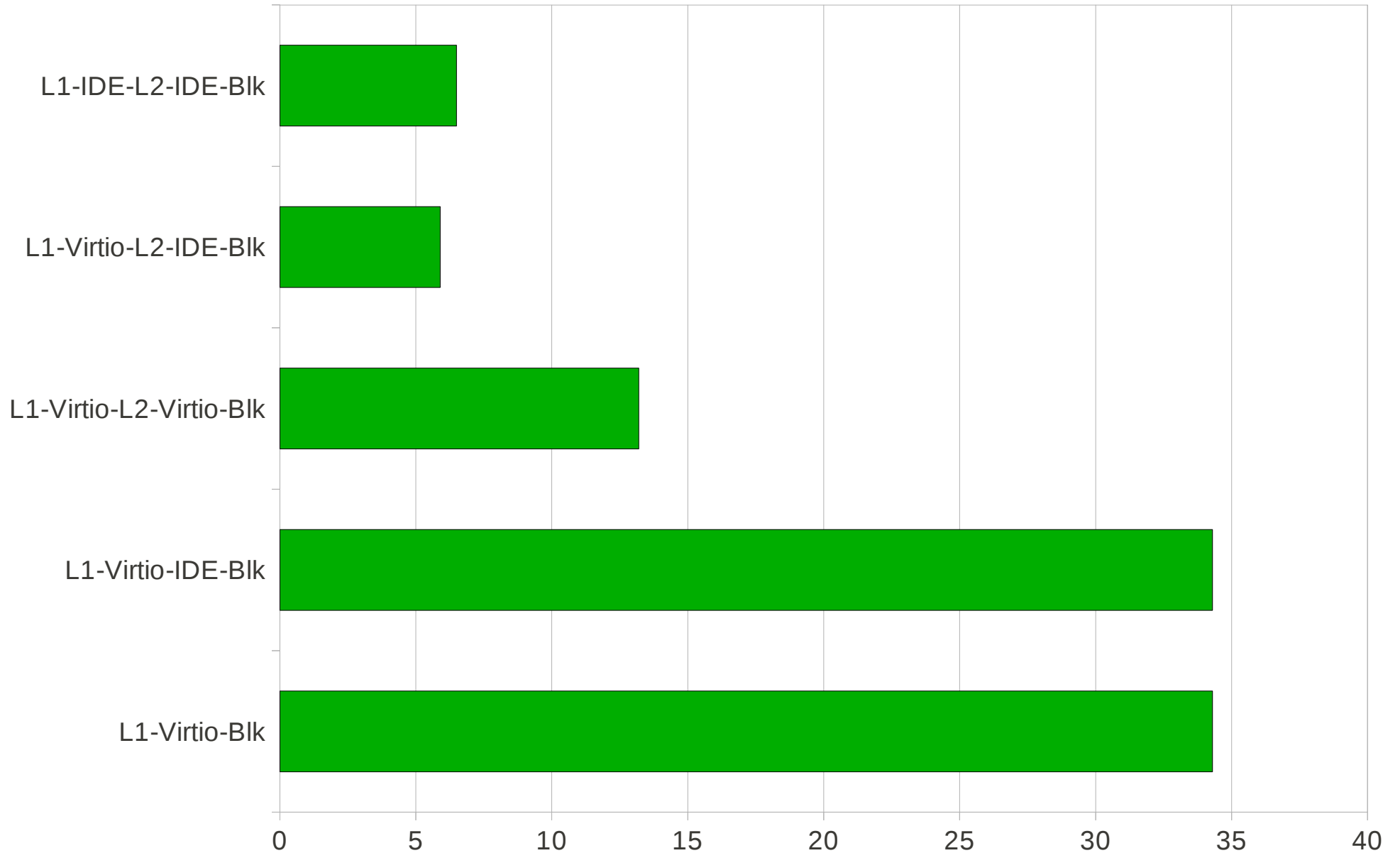
# PCMark05 – Memory Suite 2



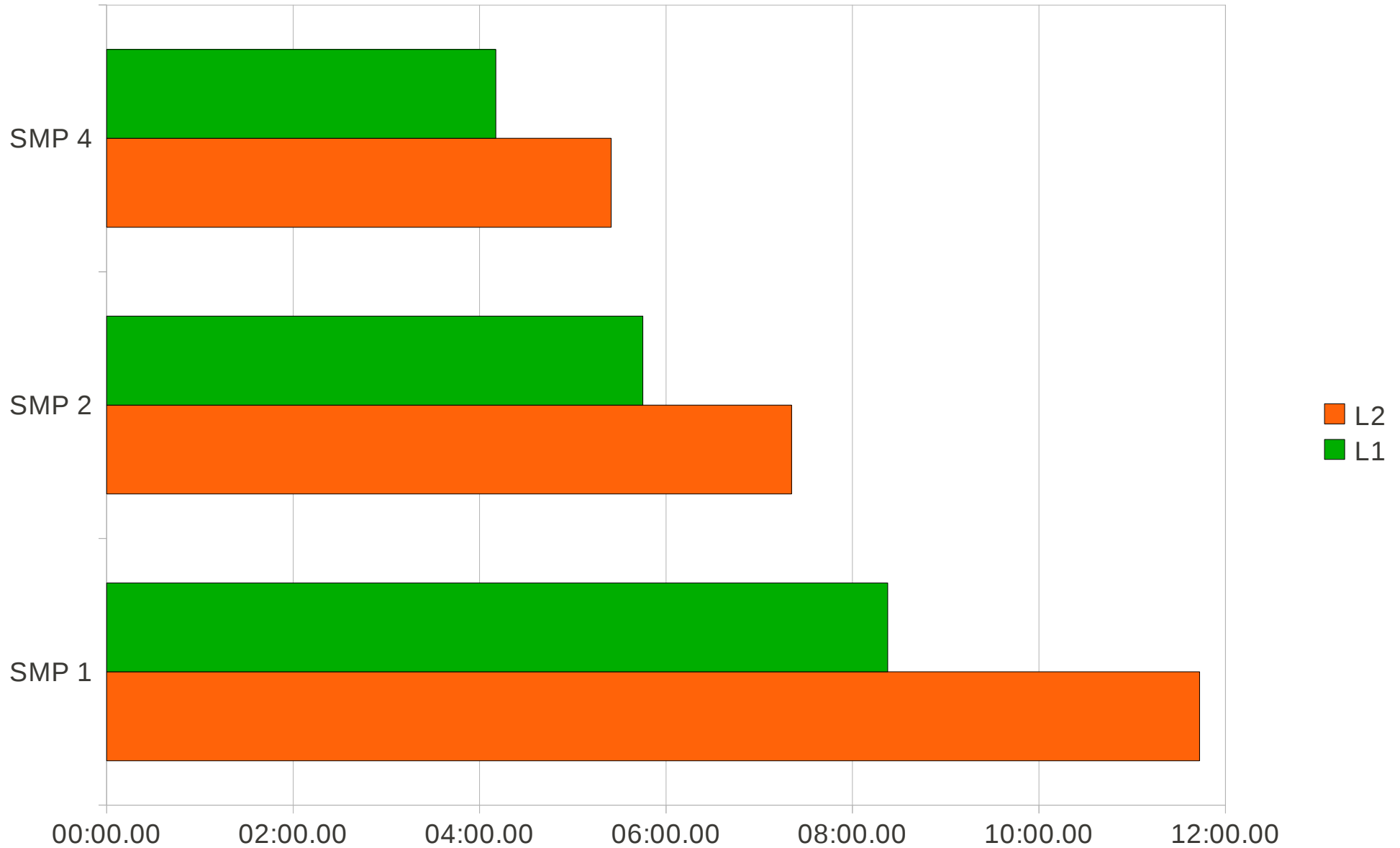
# PCMark05 – HDD Suite



# HDD Scenarios



# Kernel-Compile on SMP



# Conclusions

- CPU performance in Nested SVM is well today
- Memory performance is acceptable – still room for improvement
- IO performance really sucks
  - Slow IO makes every hypervisor besides KVM slow under Nested SVM