

# Performance

# Performance – why bother

- Performance tuning is not as important as it used to be.
- “Buy more or use less”

# Key Areas

- CPU
- Memory
- Disk

# CPU

- A well tuned system, running at it's limit will be CPU bound\*
- Processes 'compete' for CPU time the scheduler decides who get's how much
- Completely Fair Scheduler is the default for current Linux systems (<http://www.linuxjournal.com/magazine/completely-fair-scheduler>)

*\*limited by*

# Memory

- Linux/Unix systems use virtual memory.
- Memory is a lot like money, “It doesn’t matter very much until you don’t have enough.”
- Some applications allow you specify how much memory they use.
- Virtualization is memory intensive.

# I/O - Network

- Latency vs. Throughput
- Network isolation
- Testing:
  - scp is a terrible network test
  - ping is not much better
  - Test every interface
  - Use NetPerf

# I/O – Disk (HDD)

- “Spinning Rust”
- Throughput vs IOPS
- IOPS **usually** more important for commercial systems

# Factors Effecting IOPS

- Seek time
- Rotation speed
- Number of drives



# Consider the recent history of drives

In 1995 a typical enterprise drive could deliver 50 IOPS and was 100MB in size.

Today a typical enterprise drive delivers 500 IOPS and is 500GB in size.

*Anything strike you as troubling?*

# Enter SSD

- On the order of 1000 IOPS
- Expensive per GB
- Mixed solutions

# Buffer Cache

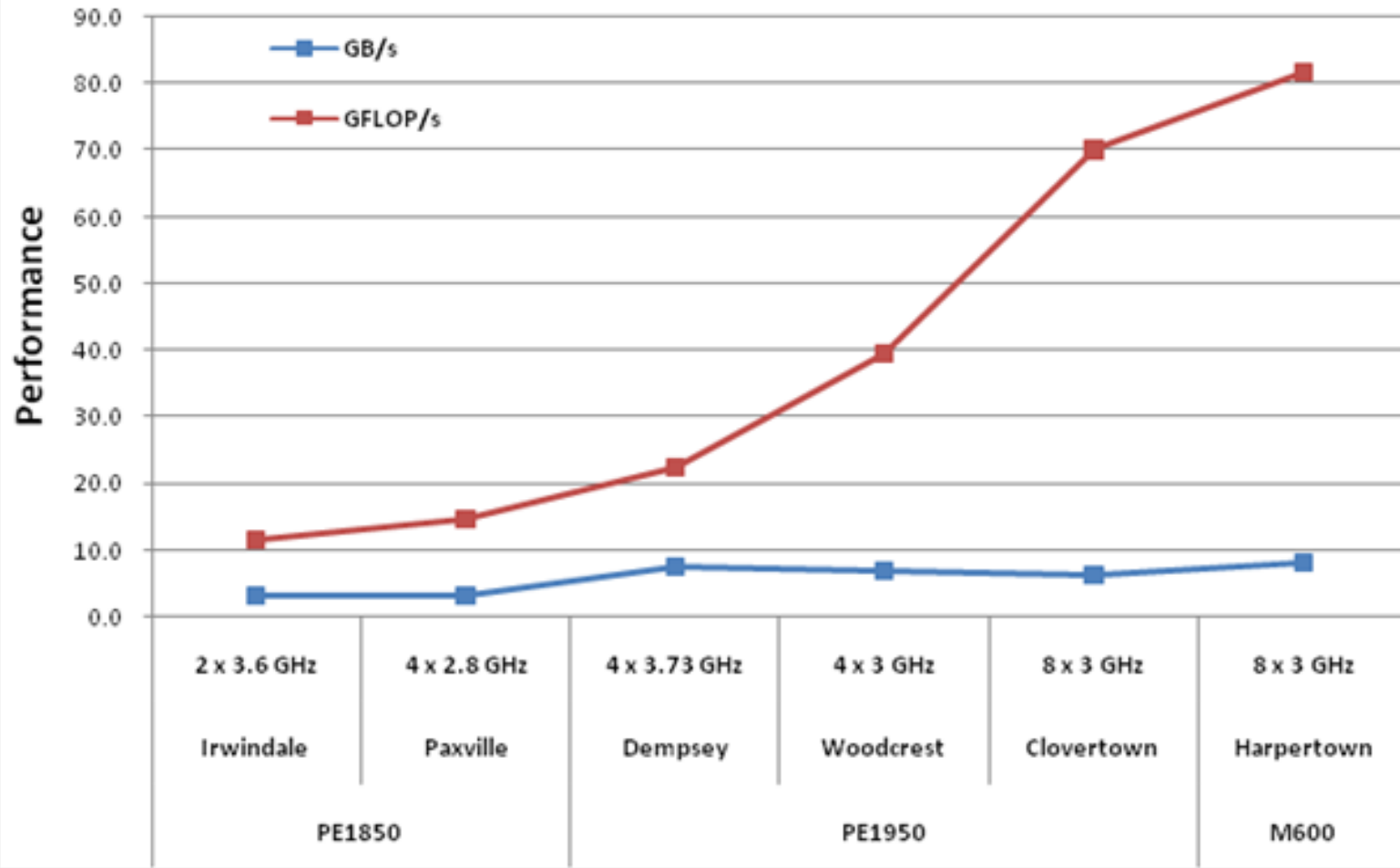
- A section of system RAM devoted to local copies of data from the file systems
- By default file system I/O passed through the buffer cache

Try this at home:

```
time cat LargeFile > /dev/null  
time cat LargeFile > /dev/null
```

Ever wonder why CPUs have so many cores and threads?

## PowerEdge CPU vs RAM



From: <http://en.community.dell.com/techcenter/high-performance-computing/w/wiki/2284>