



# Benchmarking Discussion

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# What is Benchmarking?

- **Benchmark** /<sup>l</sup>bentʃma:k/ *n. & v.* • *n.* **1** a surveyor's mark cut in a wall, pillar, building, etc., used as a reference point in measuring altitudes. **2 a** a standard or point of reference. **b** problem designed to evaluate the performance of a computer system. • *v.tr.* evaluate or check by comparison with a benchmark.

Source: Pearsall, Judy, and Bill Tumble, eds. 1996. *The Oxford English Reference Dictionary*. Second Edition. Oxford: Oxford University Press.

# Benchmarking (1/2)

- **Software Performance Analysis (Software Benchmarking):** understanding a single software system
- **Software Performance Engineering:** understanding and improving software while it is developed
- **Hardware Benchmarking:** understanding and analyzing hardware

# Benchmarking (2/2)

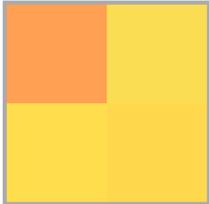
- **Benchmark Suite:** a workload (set of tasks) used to measure the performance of a program or system
- **System Monitor (Program Monitor, Monitor):** A program that observes the performance of another system or program

# Software Monitor: Ganglia

CPU's Total: **32**  
Hosts up: **4**  
Hosts down: **0**

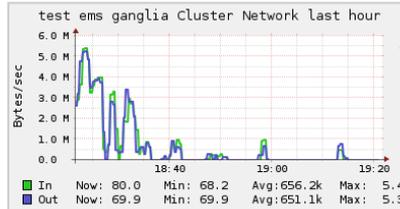
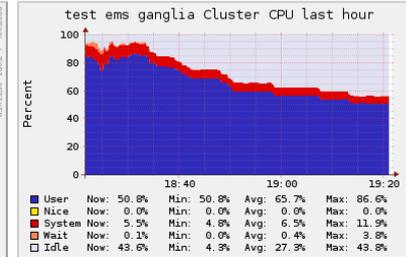
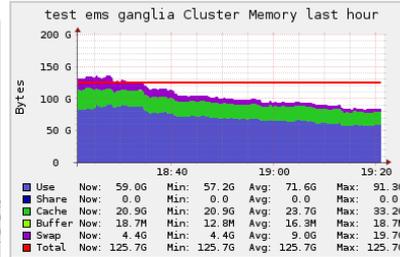
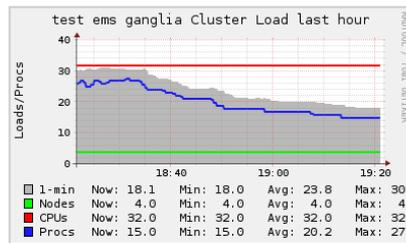
Current Load Avg (15, 5, 1m):  
**63%, 57%, 57%**  
Avg Utilization (last hour):  
**74%**

Server Load Distribution



Stacked Graph - load\_one

## Overview of test ems ganglia @ 2015-09-14 19:21



# Advantages and Limitations

- **Cluster-Agnostic, General Purpose:** Can observe performance of any software program
- **Cluster Monitor:** Monitors all activity on a hardware cluster, not just a single software program
- **Data Resolution:** Discards older samples to a lower resolution

# Questions for Thought (1/2)

- What traits are desired in a software monitor?
- What performance metrics are important to obtain?
- What are good benchmark suites for data science?  
What makes a benchmark suite good?

# Questions for Thought (2/2)

- What system architectural paradigms might influence performance? What practices might be used mitigate the influence on performance?
- What aspects of hardware, software, or system architecture might influence benchmarking performance? What practices might be used to control or characterize their influence on performance?