

# Cloud Performance Benchmark Series

## Amazon EC2 CPU Speed Benchmarks

### Appendix: Comparison with Rackspace.com Computing

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## 1. Overview

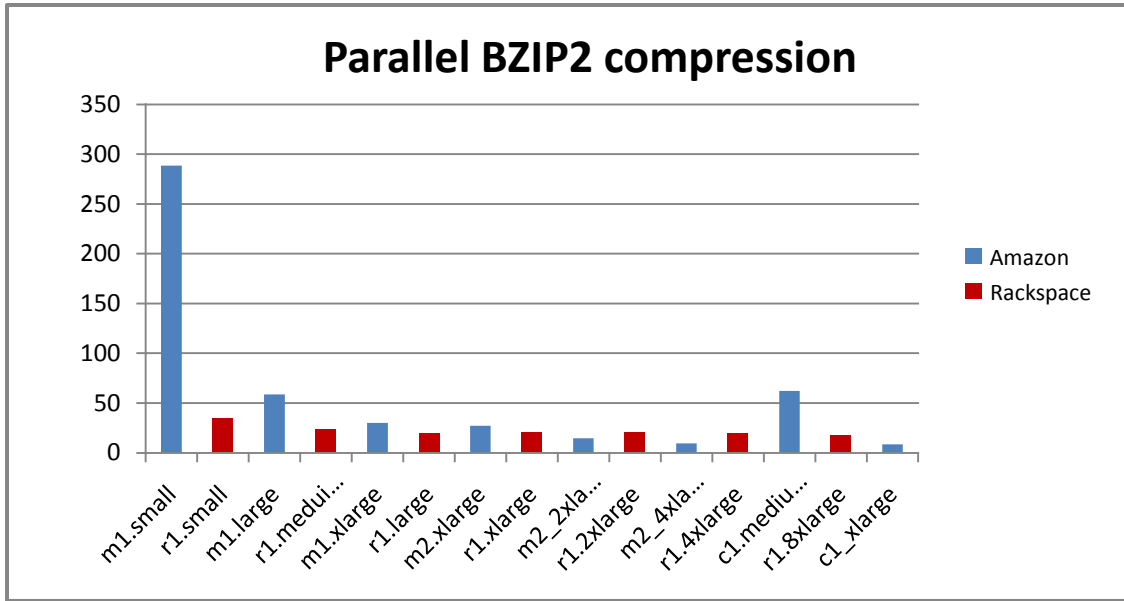
We deployed the Phoronix Test Suite to benchmark the computation throughput in a comprehensive set of scenarios and applications. Phoronix explores tens of different core applications from areas such as data compression, media encoding, cryptography, graphics rendering, scientific computation, database query processing and web serving. We also ran UBENCH to get a more thorough throughput figure at a fundamental RAM/CPU level. The allocated instances were running Ubuntu in controlled close to single-user mode.

	Instance Type	RAM(MB)	Cost per hour (USD)	HDD (GB)
Amazon EC2	m1.small	1740	0.095	160
	m1.large	7680	0.38	850
	m1.xlarge	15360	0.76	1690
	m2.xlarge	17510	0.57	420
	m2_2xlarge	35020	1.14	850
	m2_4xlarge	70041	2.28	1690
	c1.medium	1740	0.19	350
	c1_xlarge	7168	0.76	1690
Rackspace	r1.small	258	0.015	10
	r1.medium	512	0.03	20
	r1.large	1024	0.06	40
	r1.xlarge	2048	0.12	80
	r1.2xlarge	4096	0.24	160
	r1.4xlarge	8192	0.48	320
	r1.8xlarge	15872	0.96	620

## 2. Phoronix Test Suite

### 2.1. Parallel pbzip2 Compression

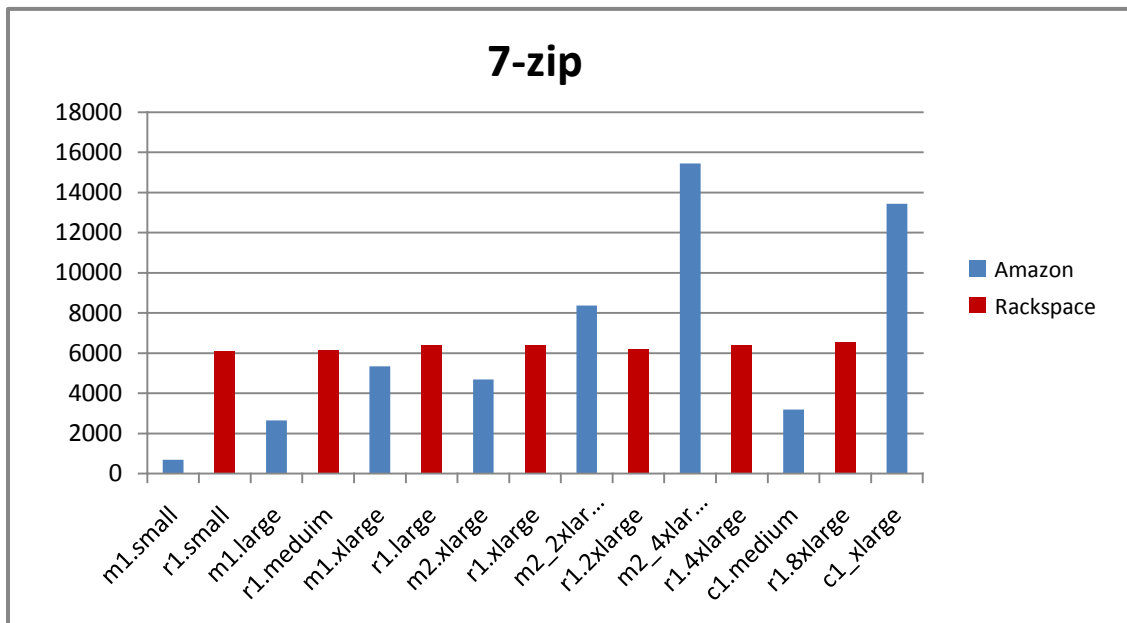
This test measures the time needed to compress a file using BZIP2 compression deploying 16 parallel threads. A 256MB file is used for compression. Performance is measured in seconds (lower is better). Note that this also includes I/O.



**Observation:** Most of the Rackspace Cloud instances perform better than Amazon.

## 2.2. 7-Zip

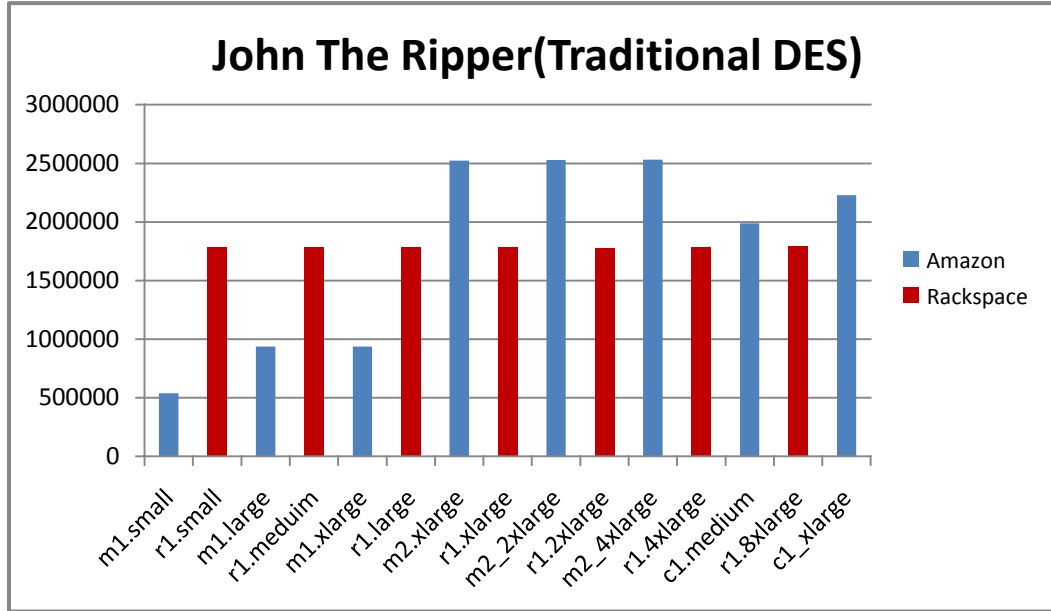
This is a test of 7-Zip using p7zip with its integrated benchmark feature. Performance is measured in MIPS (higher is better).



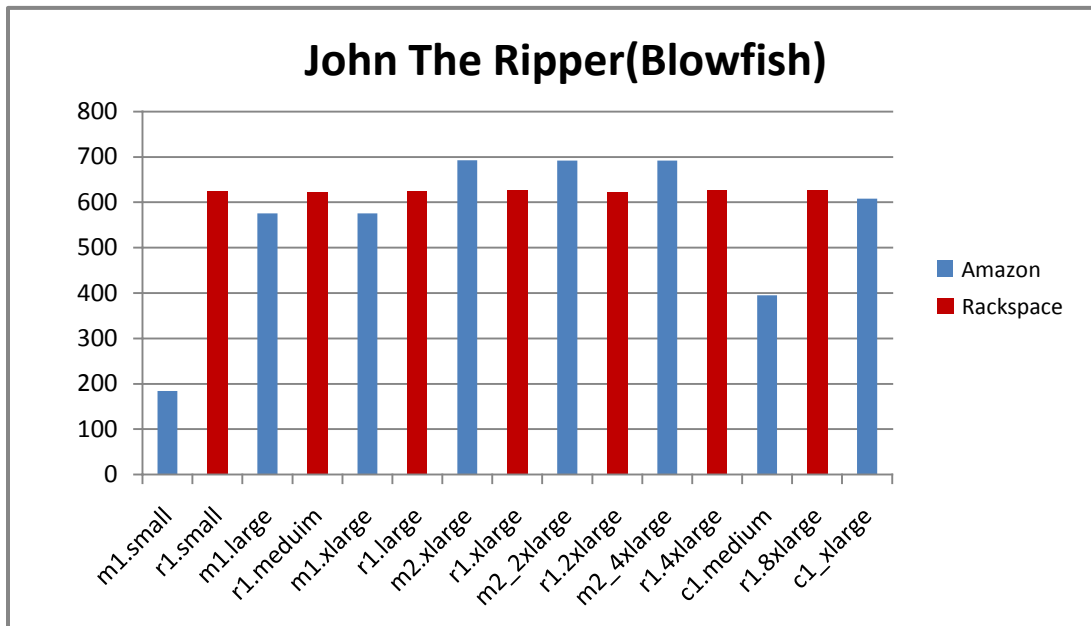
**Observation:** Curiously, rackspace instances have consistent output even with higher configuration whereas some of the Amazon EC2 instances with higher configuration show better performance.

### 2.3. John The Ripper

John the Ripper is a popular password cracker. Performance is measured in cracking combinations (of username and password) per second. Numbers for DES and Blowfish ciphers are shown (higher is better).

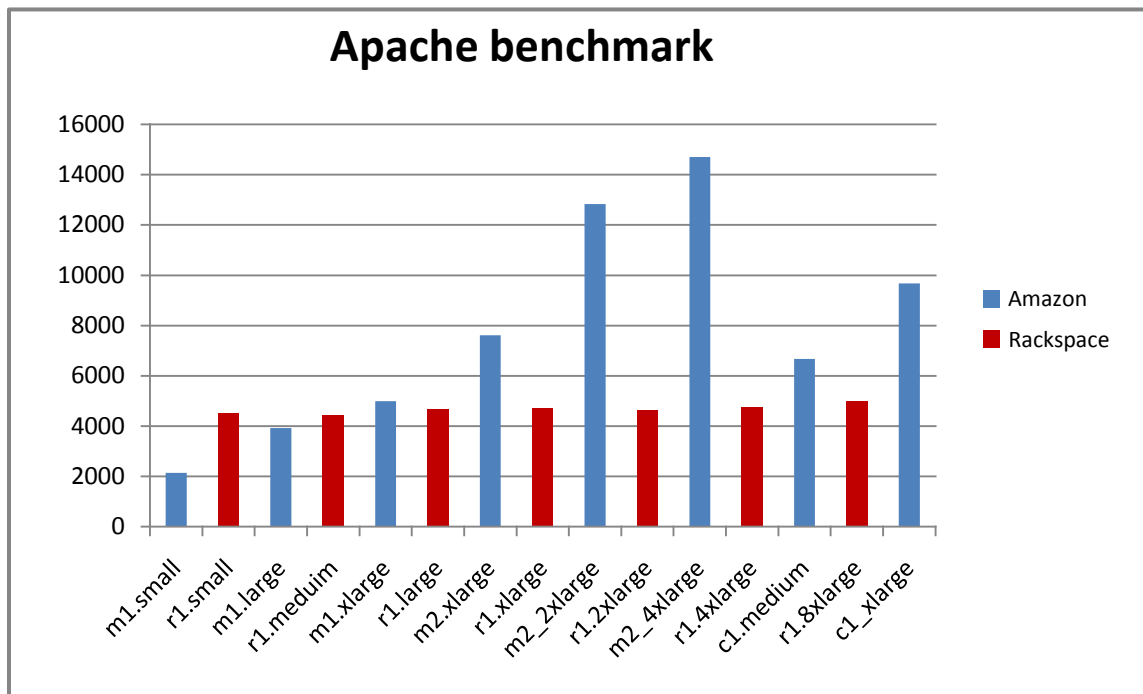


**Observation:** Rackspace Cloud instances show consistent performance even for higher configuration whereas the performance on Amazon EC2 instances increases with higher configurations. For Blowfish cipher (graph below) the performance is almost same for both service providers at every level except for the smallest instance.



## 2.4. Apache

The Apache Benchmark measures how many requests per second a given system can sustain when faced with a total of 500,000 requests, with a degree of concurrency of 100. Performance is measured in Requests per second (higher is better).

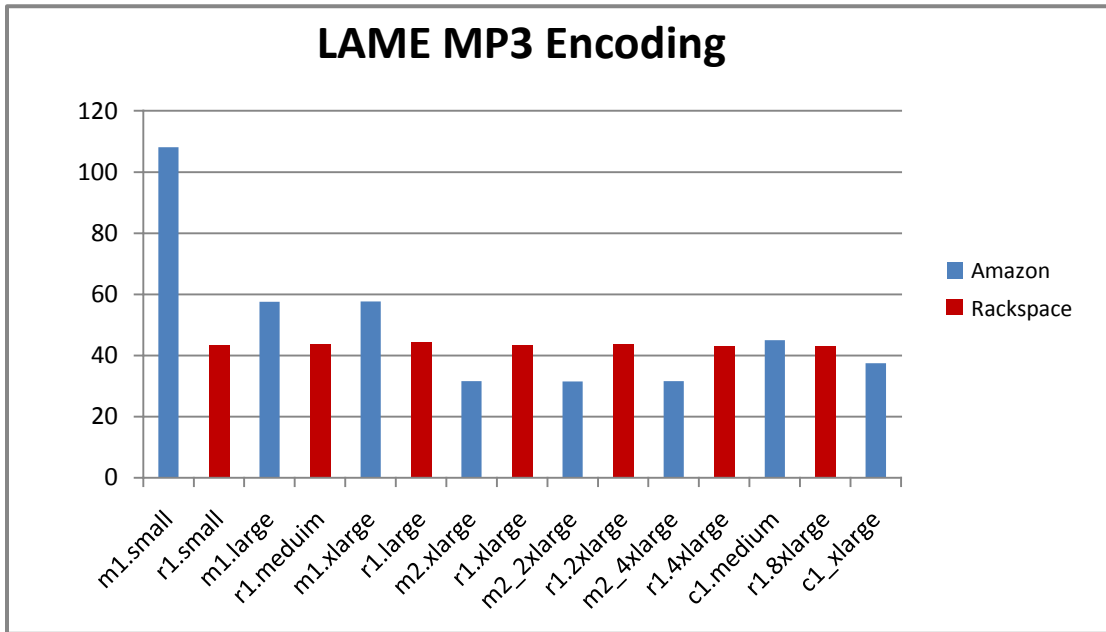


**Observation:** Rackspace Cloud instances show a very small increase even with higher configurations whereas Amazon EC2 instances show better performance for Requests per second with higher configurations.

## 2.5. Lame MP3 Encoding

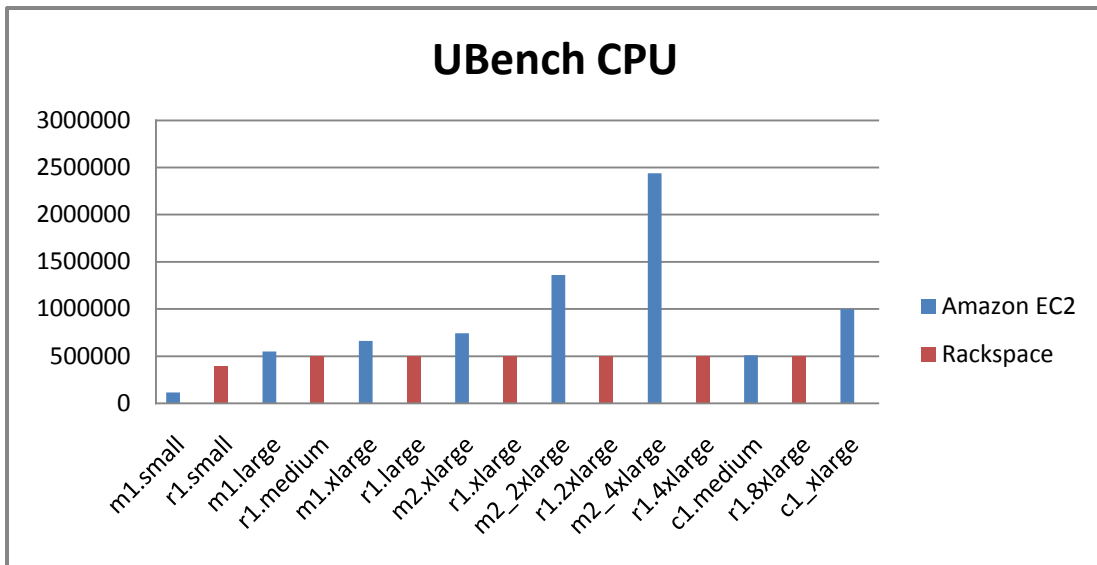
LAME is an MP3 encoder licensed under the LGPL. This test measures the time required to encode a WAV file into MP3 format. Performance is measured in seconds (lower is better).

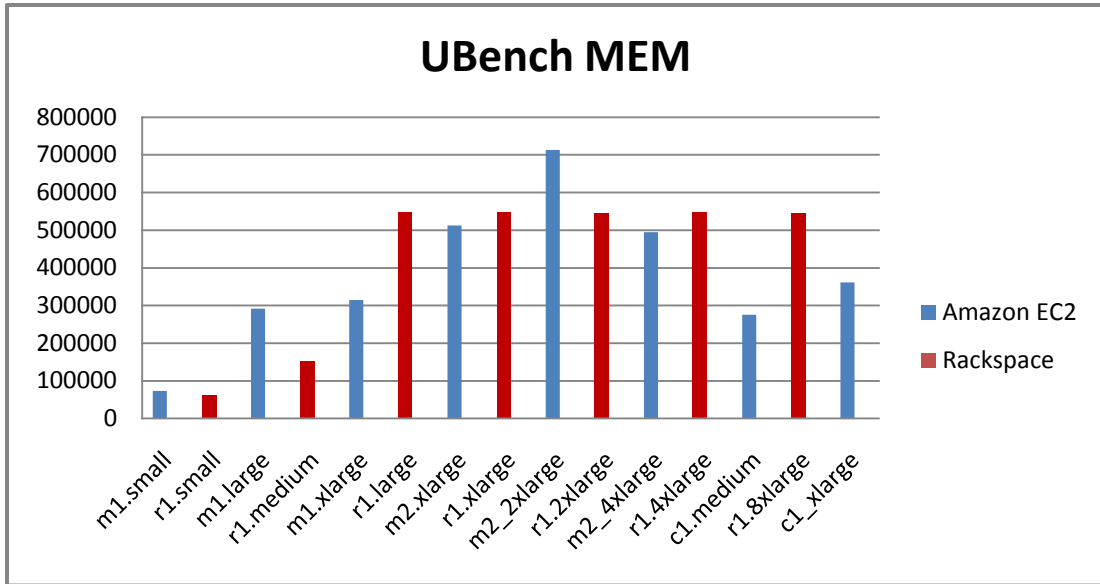
**Observation:** Measured time for Rackspace instances is almost same for all the instances whereas it decreases with higher configurations for Amazon.



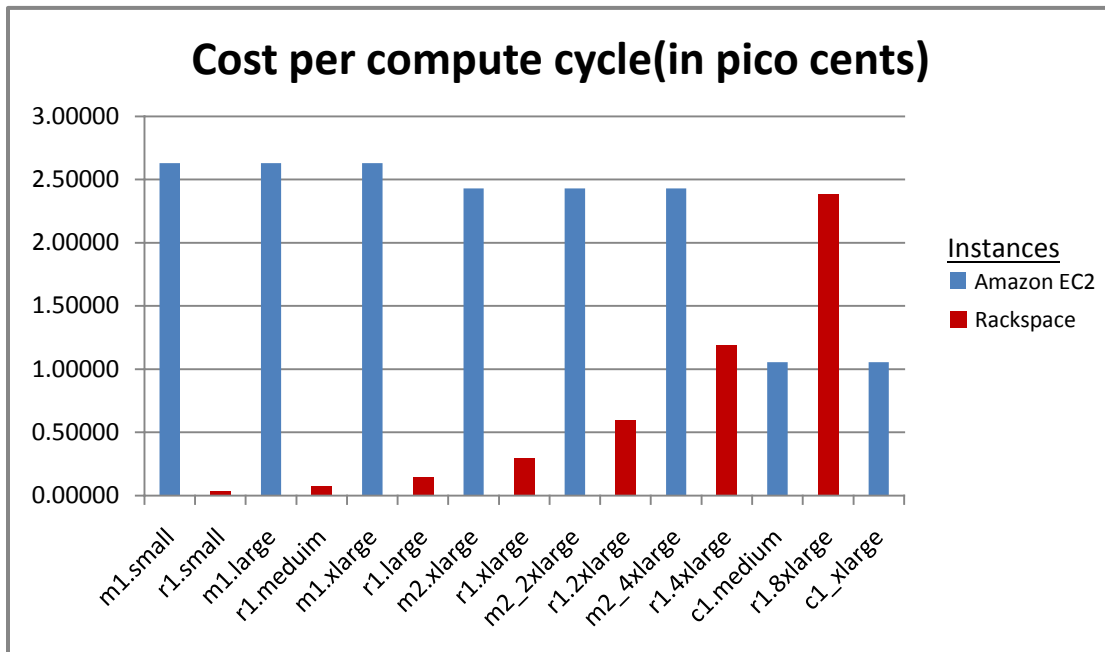
### 3. UBENCH Test Suite Results

UBENCH provides a single measure of performance for machines running various unix flavors. It tests both RAM and CPU throughput. The CPU results are achieved by executing integer and floating point calculations for 3 mins concurrently using multiple threads. The ratio of floating point calculations to integer is about 1:3. The RAM results are obtained by executing allocation and copying operations for 3 mins concurrently using several threads.





#### 4. Compute Cycle Costs



**Observation:** The cost per compute cycle increases gradually with higher configurations of Rackspace Cloud instances whereas for Amazon most of the instances fall in the range of 2 – 2.5 Pico cents per compute cycle. Rackspace may be the most cost-effective for many scenarios.