



TYPES OF WORKLOADS

TIPOS DE CARGA DE TRABAJO

TYPES OF WORKLOADS

1. TEST WORKLOAD
 - a. Pueden ser pruebas reales.
 - b. Pueden ser pruebas sintéticas.
2. REAL WORKLOAD
 - a. Analizar en operación normal
 - b. No se pueden repetir
3. SYNTHETIC WORKLOAD
 - a. Pueden aplicarse repetidamente de manera controlada
 - b. Una aproximación a las pruebas reales



TEST WORKLOAD

1. Addition instruction

2. Instruction mixes

3. Kernels

4. Synthetic programs

5. Application benchmarks



```
1  #!/bin/bash
2  for l in {0..99999}
3  do
4      a=$(( $l + 1 ))
5      echo "vamos en "$a" "
6  done
7
8  # Procesador 1.1Ghz Intel Core M
9  time ./additioninstruction.sh
10 5.31s user
11 0.65s system
12 80% cpu
13 7.412 total
14 zimlama@zimMB:~ $
15 # Procesador 2.67Ghz Intel Xeon 3450
16 time ./additioninstruction.sh
17 real    1.752s
18 user    1.439s
19 sys     0.313s
20 root@proxmox:~#
```



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TABLE 4.1 Gibson Instruction Mix

1. Load and Store	31.2
2. Fixed-Point Add and Subtract	6.1
3. Compares	3.8
4. Branches	16.6
5. Floating Add and Subtract	6.9
6. Floating Multiply	3.8
7. Floating Divide	1.5
8. Fixed-Point Multiply	0.6
9. Fixed-Point Divide	0.2
10. Shifting	4.4
11. Logical, And, Or	1.6
12. Instructions not using registers	5.3
13. Indexing	<u>18.0</u>
	100.0



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```

>zimlama@zimMB:~ $ ls -lh
total 8
drwx-----@ 5 zimlama  staff   160B Mar 20 19:04 Applications
drwx-----+ 13 zimlama  staff   416B Apr  6 16:42 Desktop
drwx-----+ 25 zimlama  staff   800B Apr  1 13:25 Documents
drwx-----@ 12 zimlama  staff   384B Apr  6 16:23 Downloads
lrwx-----  1 zimlama  staff    20B Apr  6 07:02 Google Drive File Stream -> /Volumes/GoogleDrive
drwx-----@ 73 zimlama  staff   2.3K Apr  5 11:02 Library
drwx-----+  3 zimlama  staff    96B Feb 15 22:25 Movies
drwx-----+  6 zimlama  staff   192B May  8 2018 Music
drwx-----+ 20 zimlama  staff   640B Apr  5 14:19 Pictures
drwxr-xr-x+  9 zimlama  staff   288B Apr  2 11:57 Public
-rw-r--r--  1 zimlama  staff   1.3K Apr  3 12:23 Untitled.ipynb
drwx-----  4 zimlama  staff   128B Apr  2 08:58 VirtualBox VMs
>zimlama@zimMB:~ $ ls -lh >>temp.txt
>zimlama@zimMB:~ $ wc -l temp.txt
 14 temp.txt
>zimlama@zimMB:~ $ ls -lh | wc -l
 14
>zimlama@zimMB:~ $ █

```

TEST WORKLOAD

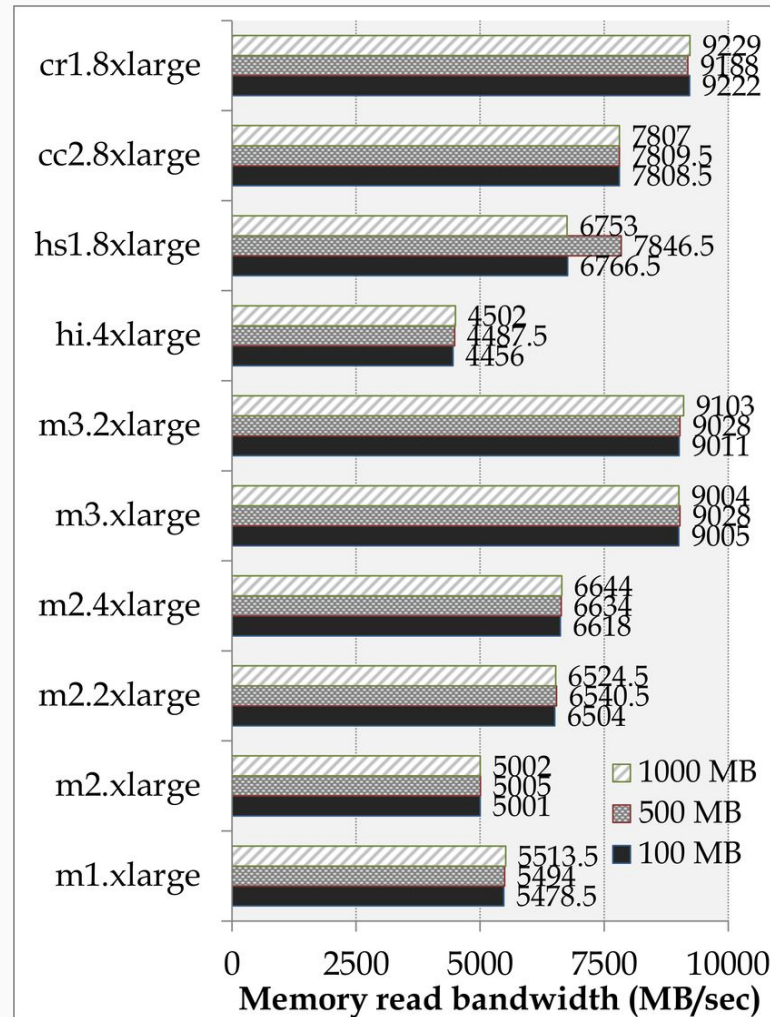
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- Sieve
 - 1. escribe los n números.
 - 2. remueve todos los múltiplos 2.
 - 3. remueve todos los múltiplos 3.
 - 4. hacer mismo proceso
 - 5. Si el número es mayor a la raíz cuadrada de n, el resultado son los números restantes primos es el que queda.
- Ackermann's Function
 - $(512 \times 4^{(n-1)} - 15 \times 2^{n+3} + 9n + 37)/3$
- Whetstone
 - 11 módulos diseñados para coincidir con la frecuencia dinámica observada de las operaciones utilizadas en 949 programas ALGOL



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- Whetstone
 - 11 módulos diseñados para coincidir con la frecuencia dinámica observada de las operaciones utilizadas en 949 programas ALGOL
- LINPACK
 - consiste en una serie de programas que resuelven sistemas densos de ecuación lineal
- Dhrystone
 - El kernell contiene muchas llamadas de procedimiento (esto simula un ambiente de programación)



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- Lawrence Livermore Loops
 - Consiste en un conjunto de 24 pruebas separadas
- Debit-Credit Benchmark
 - Simula 100 TPS deben correr con 1000 oficinas, 5000 cajeros, y 5,000,000 de cuentas.
- SPEC Benchmark Suite
-



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- SPEC Benchmark Suite
 - 1. GCC: Compiler to convert 19 preprocessed source files into assembly language output is measured.
 - 2. Espresso: Automation (EDA) tool that performs heuristic boolean function minimization for Programmable Logic Arrays (PLAs)
 - 3. Spice 2g6: is a widely used analog circuit simulation tool.
 - 4. Doduc: This is a synthetic benchmark that performs a certain aspects of a nuclear reactor.
 - 5. NASA7: This is a collection of seven floating-point intensive kernels performing matrix operations on double-precision data.



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- SPEC Benchmark Suite
 - 5. NASA7: This is a collection of seven floating-point intensive kernels performing matrix operations on double-precision data.
 - 6. LI: The elapsed time to solve the popular 9-queens problem by the LISP interpreter is measured.
 - 7. Eqntom: This benchmark translates a logical representation of a boolean equation to a truth table.
 - 8. Matrix300: This performs various matrix operations using several LINPACK routines on matrices of size 300×300 .
 -



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- SPEC Benchmark Suite
 - 9. Fpppp: This is a quantum chemistry benchmark that performs two electron integral derivatives using double-precision floating-point FORTRAN. It is difficult to vectorize.
 - 10. Tomcatv: This is a vectorized mesh generation program using double-precision floating-point FORTRAN.

./phoronix-test-suite benchmark pts/cryptopp

```

Crypto++ 8.2:
pts/cryptopp-1.0.1 [Test: Unkeyed Algorithms]
Test 1 of 1
Estimated Trial Run Count: 3
Estimated Time To Completion: 16 Minutes [16:23 UTC]
  Started Run 1 @ 16:08:11
  Started Run 2 @ 16:09:18
  Started Run 3 @ 16:10:26

Test: Unkeyed Algorithms:
192.456172
192.566087
193.017997

Average: 192.680085 MiB/second
Deviation: 0.15%

Result compared to 99 OpenBenchmarking.org samples since 13 October; median result: 295. Box plot of samples:
[
  |-----*-----|#####!#####*#####*-----*-----| ]
                This Result (4th Percentile): 193 ^

                Intel Core i7-1065G7: 318 ^   Intel Core i9-9900KS: 395 ^
                AMD Ryzen Threadripper 3970X: 390 ^
                AMD Ryzen Threadripper 3990X: 376 ^

root@proxmox:~/phoronix-test-suite#

```

./phoronix-test-suite benchmark pts/cryptopp

```

Crypto++ 8.2:
pts/cryptopp-1.0.1 [Test: Unkeyed Algorithms]
Test 1 of 1
Estimated Trial Run Count: 3
Estimated Time To Completion: 4 Minutes [16:16 UTC]
  Started Run 1 @ 16:13:16
  Started Run 2 @ 16:14:31
  Started Run 3 @ 16:15:40

Test: Unkeyed Algorithms:
  129.939307
  130.43728
  133.316826

Average: 131.231138 MiB/second
Deviation: 1.39%

Result compared to 99 OpenBenchmarking.org samples since 13 October; median result: 295. Box plot of samples:
[
  This Result (2nd Percentile): 131 ^
                                     Intel Core i7-1065G7: 318 ^   Intel Core i9-9900KS: 395 ^
                                     AMD Ryzen Threadripper 3970X: 390 ^
                                     AMD Ryzen Threadripper 3990X: 376 ^
]
zimlama@zimMB:informacion/phoronix-test-suite <master>$

```



Fuentes

- **Workloads and Workload Selection (Dr. John Mellor-Crummey, Rice University)**
- <https://www.cs.rice.edu/~johnmc/comp528/lecture-notes/Lecture4.pdf>
- **DocLite: A Docker-Based Lightweight Cloud Benchmarking Tool**
 - https://www.researchgate.net/publication/299388857_DocLite_A_Docker-Based_Lightweight_Cloud_Benchmarking_Tool
- **phoronix-test-suite (Benchmark)**
 - <https://github.com/phoronix-test-suite/phoronix-test-suite>
 - **Instalacion y ejecucion**
 - **git clone** <https://github.com/phoronix-test-suite/phoronix-test-suite.git>
 - **cd** phoronix-test-suite
 - **./phoronix-test-suite**
 - **./phoronix-test-suite list-all-tests**
 - **./phoronix-test-suite benchmark pts/cryptopp**