Performance evaluation on AWS

The following numbers were gathered on an AWS cluster

Node network I/O performance

When using netcat to transfer a 5 gb file from one VM to another VM

```
ubuntu@ip-10-73-143-203:~$ time sudo bash -c "(nc -w 3 ec2-50-17-13-245.compute-1.amazonaws.com 1234 < /mnt/bf)"
real 2m56.656s
user 0m1.612s
sys 0m15.088s
```

the throughput was 5000mb/176sec = 28.04 mb/s

Node hdd performance

Root partition

```
ubuntu@ip-10-73-143-203:~$ sync; time sudo bash -c "(dd if=/dev/zero of=bf bs=8k count=500000; sync)"
500000+0 records in
500000+0 records out
4096000000 bytes (4.1 GB) copied, 513.869 s, 8.0 MB/s
```

Partition at /mnt

```
ubuntu@ip-10-73-143-203:~$ sync; time sudo bash -c "(dd if=/dev/zero of=/mnt/bf bs=8k count=500000; sync)"
500000+0 records in
500000+0 records out
4096000000 bytes (4.1 GB) copied, 34.3706 s, 119 MB/s
```

We have to make sure to use the /mnt partition since it writes much faster than the root one

CPU

Following is the output of `cat /proc/cpuinfo` on one VM

```
processor: 0
vendor_id: GenuineIntel
cpu family: 6
model: 45
model name: Intel(R) Xeon(R)CPU E5-2650 0 @ 2.00GHz
stepping: 7
microcode: 0x70d
cpu MHz: 1795.672
cache size: 20480 KB
physical id: 1
siblings: 2
core id: 2
cpu cores: 1
apicid: 36
initial apicid: 36
fpu: yes
fpu exception: yes
cpuid level: 13
wp: yes
flags: fpu de tsc msr pae mpx cmov pat clflush mmx fxsr sse sse2 ss ht syscall nx mmconstant_tsc rep_good nopl nonstop_tsc pni pclmulqdq ssse3 cx16 pdcmid sse4_1 sse4_2 x2apic popcnt tsc_deadline_timer aes hypervisor lahf_lm arat epb xsaveopt xsaveopt pln pts dtherm
bogomips: 3591.34
clflush size: 64
cache_alignment: 64
address sizes: 46 bits physical, 48 bits virtual
power management:
```
processor : 1
vendor_id : GenuineIntel
cpu family : 6
model : 45
model name : Intel(R) Xeon(R) CPU E5-2650 0 @ 2.00GHz
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cpuid level : 13
wp : yes
flags : fpu de tsc mr pae cx8 sep cmov pat cflush fxsr sse sse2 ss ht syscall nx lm constant_tsc rep_good nopl nonstop_tsc pni pclmulqdq sse3 cx16 pcid sse4_1 sse4_2 x2apic popcnt tsc_deadline_timer aes hypervisor lahf_lm arat epb xsaveopt pln pts dtherm
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Load balancing
Load balancing is done by the AWS internal loadbalancing service: http://aws.amazon.com/elasticloadbalancing/

Results

Test Utility
Benchmark: https://github.com/futures/benchtool

A. Ingest bench using fcpreo3
Created 100 objects with one datastream of 50mb size

Size: 100 * 52428800 bytes = 5gb

B. Ingest bench using single node fcpreo4 with single thread and clustered config
Created 100 objects with one datastream of 50mb size

Size: 100 * 52428800 bytes = 5gb

C. Ingest bench using single node fcpreo4 with single thread and minimal config
Created 100 objects with one datastream of 50mb size

Size: 100 * 52428800 bytes = 5gb
Duration: 881883 ms
Throughput was 5.81 mb/s
D. Ingest bench using seven nodes fcrepo4 with seven threads and clustered config
Created 100 objects with one datastream of 50mb size
Size: $100 \times 52428800 \text{ bytes} = 5 \text{ gb}$

E. Ingest bench using seven nodes fcrepo4 with seven threads and clustered config, no indexing
Created 100 objects with one datastream of 50mb size
Size: $100 \times 52428800 \text{ bytes} = 5 \text{ gb}$

F. Ingest bench using seven nodes fcrepo4 with eleven threads and clustered config, no indexing
Created 100 objects with one datastream of 50mb size
Size: $100 \times 52428800 \text{ bytes} = 5 \text{ gb}$