CS553 Cloud Computing

Project Report

Understanding the Cost Computing in the Cloud

Harsh Parikh
A20338453

Abstract

In this project, I am going to compare own created private cloud instances with public (Amazon EC2) cloud instances.

A public cloud consists of a service or set of services that are purchased by a business or organization and delivered via the Internet by a third-party provider.

A private cloud is essentially an extension of an enterprise's traditional data centre that is optimized to provide storage capacity and processor power for a variety of functions.

Here, I have to find cost break down of private cloud and compare it with public (Amazon EC2) cloud. In this project, I did some experiment on different instances and found that private clouds are best to scale for larger data scale, while public clouds are best for small amount of data.

PUBLIC CLOUD (AMAZON EC2) COST TABLE

The below table provides information regarding various Amazon EC2 instances. Each vCPU of the instance is a hyper thread of the Intel Xeon processor. Thus each instance has cores which is equal to half the number of vCPU. I use this information of number of cores to compute capacity in Gflops of each instance.

In this project, I have built a private cloud for all the amazon instances and compare the cost of each instance per hour per TFlops. To build a private cloud the factors I consider are Processor, Storage, Memory, Network Adapter, Network Switch, System Admin, Cooling Power, System Power, Chassis, Rack, UPS, Motherboard, Housing and Firewall. I consider building a private cloud from the scratch. While building the private cloud I check the compatibility of the hardware with the other factors.

The total mentioned in the table is the cost of the instance amortized for 5 years. All the considered processors support hyper threading and while considering GFlops I also multiply the number of hyper threads which is 2 to the number of cores * instructions per cycle * processor speed.

Instance Type	vCPU	IPC	Gflops	Memory (GiB)	Storage (GB)	Networking Performance	Physical Processor	Clock Speed (GHz)	Price
m4.10xlarge	40	16	768	160	EBS Only	10Gbps	Intel Xeon E5-2676 v3	2.4	$2.394
m3.large	2	8	20	7.5	1 * 32 SSD	Moderate (500Mbps)	Intel Xeon E5-2670 v2	2.5	$0.133
m3.2xlarge	8	8	20	7.5	1 * 32 SSD	Moderate (500Mbps)	Intel Xeon E5-2670 v2	2.5	$0.133
c3.8xlarge	32	8	358.4	60	2 * 320 SSD	10Gbps	Intel Xeon E5-2680 v2	2.8	$1.680
g2.2xlarge	8	8	83.2	15	1 * 60 SSD	High (1Gbps)	Intel Xeon E5-2670	2.6	$0.650
r3.4xlarge	16	8	160	122	1 * 320 SSD	High (1Gbps)	Intel Xeon E5-2670 v2	2.5	$1.33
i2.8xlarge	32	8	320	244	8 * 800 SSD	10Gbps	Intel Xeon E5-2670 v2	2.5	$6.82
d2.8xlarge	36	16	691.2	244	24 * 2000	10Gbps	Intel Xeon E5-2676 v3	2.4	$5.52

PRIVATE CLOUD

Now, I would calculate the private cloud cost for 8 instances namely, m4.10xlarge.private, m3.large.private, m3.2xlarge.private, c3.8xlarge.private, g2.2xlarge.private, r3.4xlarge.private, i2.8xlarge.private, and d2.8xlarge.private which are equivalent to the 8 different Amazon EC2 Instance Types mentioned above (i.e. m4.10xlarge, m3.large, m3.2xlarge, c3.8xlarge, g2.2xlarge, r3.4xlarge, i2.8xlarge, and d2.8xlarge).

I would build the above mentioned private clouds for all the amazon instances and compare the cost of each instance per hour. As I am building the private clouds from scratch, I would consider cost factors like Processor, Storage, Memory, Network Adapter, Network Switch, Motherboard, Chassis, Rack, UPS, System Power, Cooling Power, System Administrator.

The total cost mentioned in the tables below are the cost of the instances amortized for a running time of 5 years. All the processors that I am considering for the creation of private cloud supports hyper threading. For calculating GFlops I use the below formula:

$$GFlops = Number\ of\ Cores \times Instructions\ per\ cycle\ \times Processor\ Speed$$

1) m4.10xlarge.private:

Components	Details	Cost
Processor	INTEL XEON E5-2676 V3 2.40ghz SR1Y5 30Mb 12 Cores	3600
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	4 * Crucial 64GB (4 x 16GB) 288-Pin DDR4 SDRAM	1,146
Storage	Dell 300 GB 3.5" Internal Hard Drive	184.49
Methorboard	ASUS Z10PE-D16/2L/10G-2T	599.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1876.4	7396.7688
Cooling Power	415.85	1639.2807
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**547490.63**

The new M4 instances feature a custom Intel Xeon E5-2676 v3 Haswell processor optimized specifically for EC2. They run at a base clock rate of 2.4 GHz and can go as high as 3.0 GHz with Intel Turbo Boost. This instance is latest generation of general purpose computing with highest configuration in this type. The m4.10xlarge.private requires 40 vCPU and the processor chip for this instance has 12 cores. So I take 2 chip per instance which provides 20 cores for creating 40 vCPU. The memory, storage, chassis, motherboard are considered to fit a single instance. The Gflops of this private instance is 20*16*2.4=768 Gflops. The total amortized cost for 5 years is $**547,490.63**. The cost for a single instance is $**12.42** per hour.

2) m3.large.private

Components	Details	Cost
Processor	Intel Xeon E5-2670 v2 Ivy Bridge-EP 2.5 GHz 25MB L3 Cache LGA 2011 115W BX80635E52670V2 Server Processor	1559.99
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	3 * 32GB (4 x 8GB) 240-Pin DDR3 SDRAM DDR3 1600 (PC3 12800)	405
Storage	4 * Intel 320 Series 2.5" 80GB SATA II MLC Internal Solid State Drive (SSD) SSDSA2CW080G3K5	559.96
Methorboard	E5 ATX Workstation/Server Motherboard DDR3 1600 12xUSB,	271.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1419.4	5595.2748
Cooling Power	389.25	1534.4235
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**540796.44**

This instance provides general purpose computing for small or mid-size applications. It provides provides a balance of compute, memory, and network resources. The m3.large.private requires 2 vCPU and has a 10 core processor which can be shared between 10 instances by dedicating 1 core to each instance to produce 2 vCPU per instance. The memory, storage, chassis, motherboard are also considered to fit 10 instances into a single machine. The Gflops of this private instance is 10*8*2.5=200, so each instance has a compute capacity of 20 Gflops. The total amortized cost for 5 years is **$540,796.44**. The cost for a single instance is **$12.33** per hour.

3) m3.2xlarge.private

Components	Details	Cost
Processor	Intel Xeon E5-2670 v2 Ivy Bridge-EP 2.5 GHz 25MB L3 Cache LGA 2011 115W BX80635E52670V2 Server Processor	1559.99
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	4 * Crucial Ballistix Sport 8GB (2 x 4GB) 240-Pin DDR3 SDRAM DDR3	132
Storage	5 * HP 2.5" 32GB SATA Internal Solid State Drive (SSD) 461201-B21	694.45
Methorboard	SUPERMICRO X9SRA Single Socket R (LGA 2011) E5 ATX Workstation/Server Motherboard DDR3 1600 12xUSB, 2x PCI-E 3.0 x16	271.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1522.78	6002.7988
Cooling Power	416.98	1643.7352
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**541174.75**

This instance provides general purpose computing for small or mid-size applications but powerful than m3.large.private computation wise. The m3.2xlarge.private requires 8 vCPU and has a 10 core processor which can be shared between 2 instances by dedicating 4 core to each instance to produce 8 vCPU per instance. The memory, storage, chassis, motherboard are also considered to fit 2 instances into a single machine. The Gflops of this private instance is 8*8*2.5=160, so each instance has a compute capacity of 80 Gflops. The total amortized cost for 5 years is **$541,174.75**. The cost for a single instance is $**12.36** per hour.

4) c3.8xlarge.private

Components	Details	Cost
Processor	Intel Xeon E5-2680 v2 Ivy Bridge-EP 2.8 GHz 25MB L3 Cache LGA 2011 115W BX80635E52680V2 Server Processor	3539.98
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	1 * Crucial 64GB (4 x 16GB) 288-Pin DDR4 SDRAM	382
Storage	SAMSUNG 850 PRO 2.5" 1TB SATA III 3-D Vertical Internal Solid State Drive (SSD) MZ-7KE1T0BW	411.99
Methorboard	ASUS Z10PE-D16/2L/10G-2T	599.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1727.99	6811.7366
Cooling Power	687.24	2709.1001
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**545324.52**

This instance with use of a high clock speed processor provides a platform for running high performance science and engineering applications. The c3.8xlarge.private requires 32 vCPU and the processor chip for this instance has 10 cores. So I take 2 chip per instance which provides 16 cores for creating 32 vCPU. The memory, storage, chassis, motherboard are also considered to fit a single instance. The Gflops of this private instance is 16*8*2.8=358.4 Gflops. The total amortized cost for 5 years is $**545,324.52**. The cost for a single instance is **$12.45** per hour.

5) g2.2xlarge.private

Components	Details	Cost
Processor	Intel Xeon E5-2670 v2 Ivy Bridge-EP 2.5 GHz 25MB L3 Cache LGA 2011 115W BX80635E52670V2 Server Processor	1559.99
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	**2 * Crucial Ballistix Sport 8GB (2 x 4GB) 240-Pin DDR3 SDRAM DDR3**	66
Storage	**2 * HP 2.5'' 32GB SATA Internal Solid State Drive (SSD) 461201-B21**	277.78
Methorboard	SUPERMICRO X9SRA Single Socket R (LGA 2011) E5 ATX Workstation/Server Motherboard DDR3 1600 12xUSB, 2x PCI-E 3.0 x16	271.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1487.98	5865.6172
Cooling Power	459.04	1809.5357
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
GPU	NVIDIA® Quadro® K5000 for Mac VCQK5000MAC-PB 4GB 256-bit GDDR5 PCI Express 2.0 x16 SLI Supported Workstation Video Card	1836.78
Total 5 Year Cost		**540720.72**

This instance has a GPU which can produce 2100 Gflops and accelerates graphics and general purpose GPU compute applications. The memory, storage, chassis, motherboard are also considered to fit 2 instances into a single machine. The Gflops of this private instance is 8*8*2.6=166.4, so each instance has a compute capacity of 83.2 Gflops + GPU flops (2100) = 2183.2 Gflops. The total amortized cost for 5 years is **$540,720.72**. The cost for a single instance is **$12.34** per hour.

6) r3.4xlarge.private

Components	Details	Cost
Processor	Intel Xeon E5-2670 v2 Ivy Bridge-EP 2.5 GHz 25MB L3 Cache LGA 2011 115W BX80635E52670V2 Server Processor	1559.99
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	2 * Kingston 64GB (4 x 16GB) 240-Pin DDR3 SDRAM ECC Registered DDR3 1600 Server Memory DR x4 Model KVR16R11D4K4/64	726
Storage	4 * Intel 320 Series 2.5" 80GB SATA II MLC Internal Solid State Drive (SSD) SSDSA2CW080G3K5	559.96
Methorboard	SUPERMICRO X9SRA Single Socket R (LGA 2011) E5 ATX Workstation/Server Motherboard DDR3 1600 12xUSB, 2x PCI-E 3.0 x16	271.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1328.4	5236.5528
Cooling Power	473.94	1868.2715
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**541092.57**

This instance is optimized for memory-intensive applications. The r3.4xlarge.private requires 16 vCPU and the processor chip for this instance has 10 cores. So 1 machine can be used for creation of 1 instance. The memory, storage, chassis, motherboard are also considered to fulfil a single instance requirement. The Gflops of this private instance is 8*8*2.5=160 Gflops. The total amortized cost for 5 years is **$541,092.57** The cost for a single instance is **$12.35** per hour.

7) i2.8xlarge.private

Components	Details	Cost
Processor	Intel Xeon E5-2670 v2 Ivy Bridge-EP 2.5 GHz 25MB L3 Cache LGA 2011 115W BX80635E52670V2 Server Processor	1559.99
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	4 * Kingston 64GB (4 x 16GB) 240-Pin DDR3 SDRAM ECC Registered DDR3 1600 Server Memory DR x4 Model KVR16R11D4K4/64	1,452
Storage	6 * SAMSUNG 850 PRO 2.5" 1TB SATA III 3-D Vertical Internal Solid State Drive (SSD) MZ-7KE1T0BW	2,471.94
Methorboard	SUPERMICRO X9SRA Single Socket R (LGA 2011) E5 ATX Workstation/Server Motherboard DDR3 1600 12xUSB, 2x PCI-E 3.0 x16	271.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	2068.4	8153.6328
Cooling Power	516.65	2036.6343
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**547495.93**

The i2.8xlarge.private requires 32 vCPU and the processor chip for this instance has 10 cores. So I take 2 chip per instance which provides 16 cores for creating 32 vCPU. The memory, storage, chassis, motherboard are considered to fit a single instance. The Gflops of this private instance is 16*8*2.5= 320 Gflops. The total amortized cost for 5 years is **$547,495.93** The cost for a single instance is **$12.49** per hour.

8) d2.8xlarge.private

Components	Details	Cost
Processor	INTEL XEON E5-2676 V3 2.40ghz SR1Y5 30Mb 12 Cores	3600
Chassis	Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U	407.79
Memory	4 * Crucial 64GB (4 x 16GB) 288-Pin DDR4 SDRAM	1,528
Storage	6 * Seagate Internal Hard Drive ST8000AS0002 8TB 128MB Cache	1,379.94
Methorboard	ASUS Z10PE-D16/2L/10G-2T	599.99
Rack	42U 4 Post Open Frame Server Rack	269
Network Switch	CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Ethernet	315
System Admin	1,00,000	500000
System Power	1996.8	7871.3856
Cooling Power	416.52	1641.9218
Network Adapter	Intel Ethernet Converged Network Adapter X520-SR2	498.09
UPS	APC SMC1500 1440VA 900W UPS 8 ports	330.95
Firewall	Cisco Meraki MX400 Security Appliance + 5yr of Enterprise License and Support	29049
Total 5 Year Cost		**546665.65**

This instance provides 48 TB of HDD-based local storage and delivers high disk throughput performance. The d2.8xlarge.private requires 36 vCPU and the processor chip for this instance has 12 cores. So I take 2 chip per instance which provides 18 cores for creating 36 vCPU. The memory, storage, chassis, motherboard are considered to fit a single instance. The Gflops of this private instance is 18*16*2.4= 691.2 Gflops. The total amortized cost for 5 years is $546,665.65. The cost for a single instance is $12.48 per hour.

# COST COMPARISON OF PUBLIC (AMAZON EC2) AND PRIVATE CLOUD

Plot1:

Instance Type	1	10	100	1000	10000	100000	1000000
m4.10xlarge	3.1171875	3.11719	3.11719	3.11719	3.11719	3.11719	3.11719
m3.large	6.65	6.65	6.65	6.65	6.65	6.65	6.65
m3.2xlarge	6.65	6.65	6.65	6.65	6.65	6.65	6.65
c3.8xlarge	4.6875	4.6875	4.6875	4.6875	4.6875	4.6875	4.6875
g2.2xlarge	0.29772811	0.29773	0.29773	0.29773	0.29773	0.29773	0.29773
r3.4xlarge	8.3125	8.3125	8.3125	8.3125	8.3125	8.3125	8.3125
i2.8xlarge	21.3125	21.3125	21.3125	21.3125	21.3125	21.3125	21.3125
d2.8xlarge	7.98611111	7.98611	7.98611	7.98611	7.98611	7.98611	7.98611
m4.10xlarge.private	16.17808527	16.17809	16.17809	8.294658	1.543333	0.539561	0.431384
m3.large.private	616.8286373	616.8286	123.3657	13.26571	2.378689	1.290006	1.181209
m3.2xlarge.private	154.5148924	154.5149	77.25745	13.36789	2.836977	1.736243	1.627356
c3.8xlarge.private	34.73864796	34.73865	34.73865	12.22323	2.174216	1.090238	0.981907
g2.2xlarge.private	5.654645467	5.654645	5.654645	5.654645	1.175072	0.175929	0.067716
r3.4xlarge.private	77.21069838	77.2107	77.2107	12.36629	2.767713	1.689495	1.580609
i2.8xlarge.private	39.06220981	39.06221	39.06221	10.68915	2.420828	1.361893	1.253216
d2.8xlarge.private	18.05693116	18.05693	18.05693	9.297568	1.713134	0.667898	0.559257

Cost Comparision: Private Cloud Vs. Public Cloud(Amazon EC2)
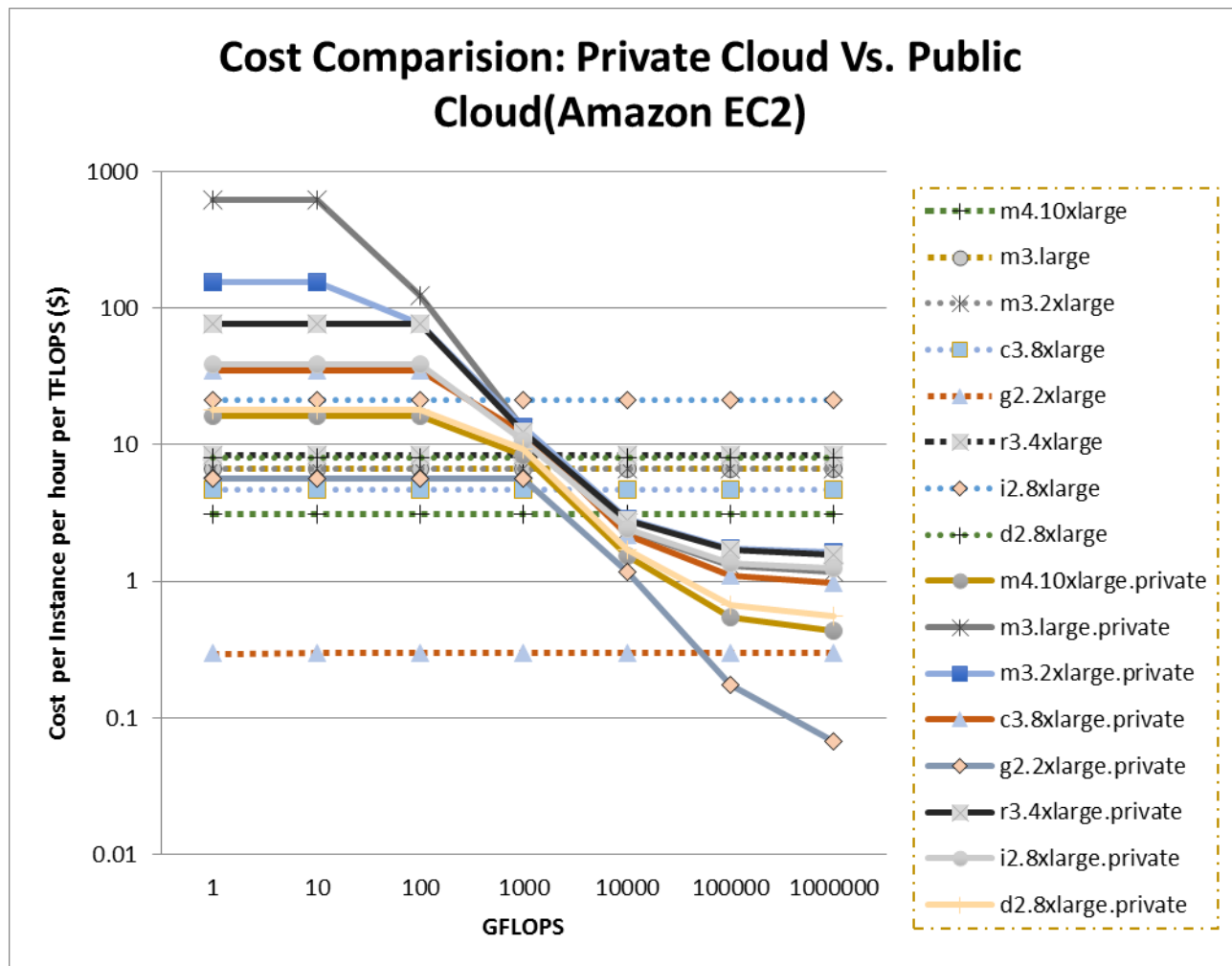
The above graph shows the cost per instance per hour per TFlops for each instance of public and private cloud. The values have been scaled by 1000 to visualize properly within the graph. This graph takes its data points as cost per hour to compute 1 Gflop to 1 Pflop. (The x axis shows Gflops range) It can be observed from the graph that private instances reach the break-even point around 1000 Gflops to 10000 Gflops range in most of the cases. After that point private instance provide cheaper rate than public instance. In public cloud the cost per hour remains constant across instance but that is not the case with private cloud. The cost per hour for private cloud decreases as number of instances increase as administration cost and other fixed cost is amortized with the increase in number of instances.

Plot2:

Instance Type	1	10	100	1000	10000	100000	1000000
m4.10xlarge.private					100	17.30922	13.83889
m3.large.private				100	35.76976	19.39859	17.76255
m3.2xlarge.private					100	26.10892	24.47152
c3.8xlarge.private					100	23.25842	20.94734
g2.2xlarge.private						100	22.74418
r3.4xlarge.private				100	33.2958	20.32475	19.01484
i2.8xlarge.private				100	11.35873	6.390113	5.880191
d2.8xlarge.private				100	21.45142	8.36325	7.002876
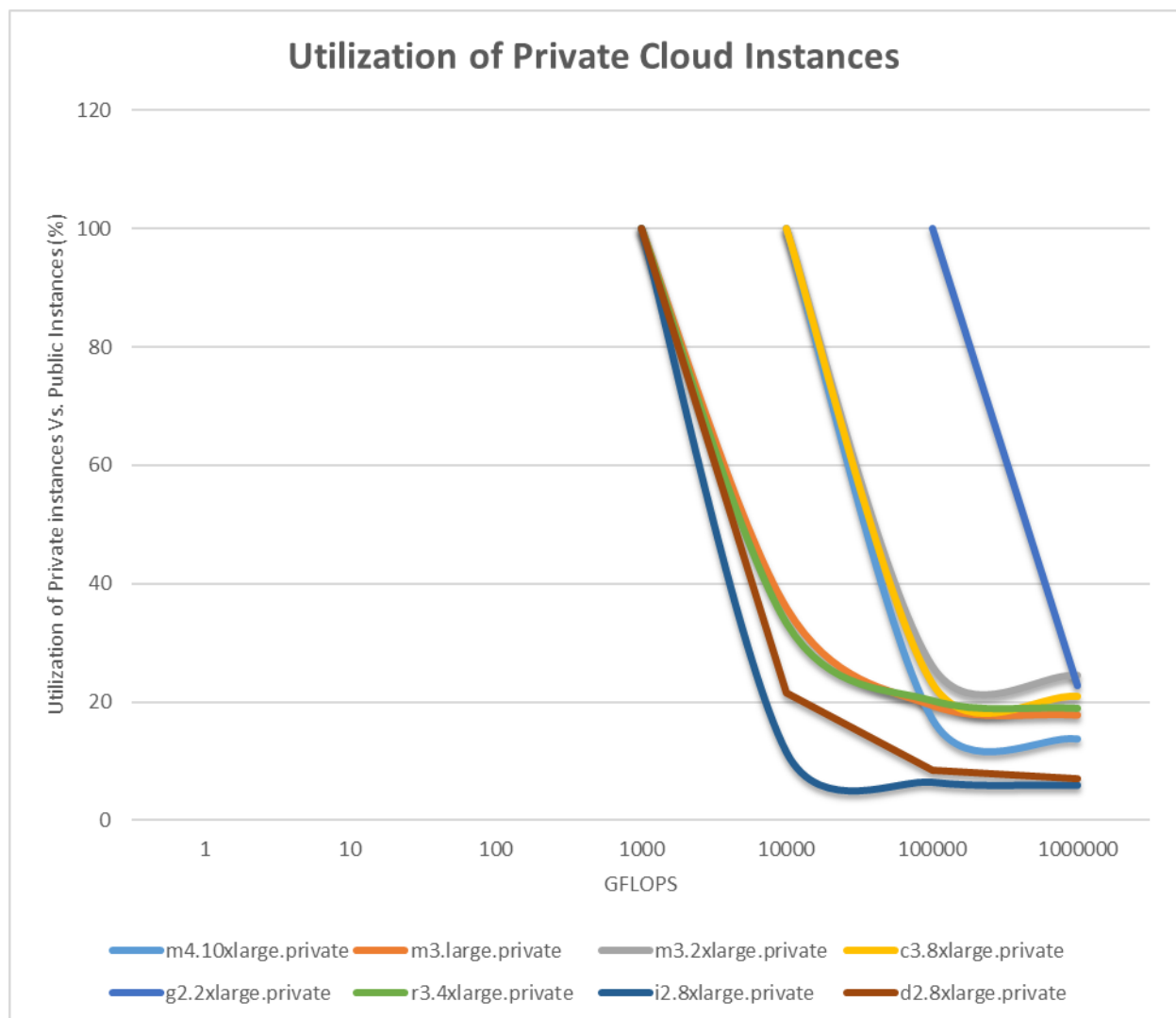
The above graph shows the utilization of private cloud as the compute capacity increases from 1Gflop to 1Pflop. It shows what percentage of private cloud gets used to break-even the cost. This visual depicts clearly where private cloud is advantageous to use (in terms of cost) than a public cloud (in our case Amazon EC2). m3.large.private, r3.4xlarge.private, i2.8xlarge.private and d2.8xlarge.private instances break even between 1000 and 10000Gflops.

m3.10xlarge.private, m3.2xlarge.private, c3.8xlarge.private instances break even between 10000 and 100000Gflops. g2.2xlarge.private instance break even between 100Tflops and 1000Tflops. At 1000Tflops the instance has 22.74% utilization which means it is cost effective to buy this instance if the present work load uses more than 22.74% of the instance compute capacity.

SCREEN SHOTS

ebay   Shop by category ▾   Search... | All Categories ▾ | Search   Advanced

Your eBay Shopping Cart

Send us your comments

> ▶ The seller revised one or more of the listings in your cart. Please review the updated listings before proceeding.

Cart summary (6 items)

Total: $3,628.03

Proceed to checkout

Seller refurbnetworks (373★)   Pay only this seller   Request total from seller ⓘ

▶ This listing has been revised. Review the updated listing before purchasing this item.

CISCO WS-C3750G-24PS-S 24 Port Switch with (24) 10/100/1000 Gigabit PoE Etherne
Condition: Used

Quantity: 1 $329.95

Standard (4 business days)   FREE
FedEx Ground or FedEx Home Delivery
eBay **FAST'N FREE**

Remove | Save for later

Seller raisingelectronics (1474★)   Pay only this seller   Request total from seller ⓘ

42U 4 Post Open Frame Server Rack 19" Adjustable Depth 25"-37" Aluminum
Condition: New

Quantity: 1 $269.00

Standard (6 business days) ▾   FREE
Standard Shipping

Remove | Save for later

Seller newegg (624068 ★)   Pay only this seller   Request total from seller ⓘ

▶ This listing has been revised. Review the updated listing before purchasing this item.

ASUS Z10PE-D16/2L/10G-2T EEB Server Motherboard 2 x Socket R3 LGA 2011-3 Intel C
Condition: New

Quantity: 1 $599.99

Economy (5 business days) ▾   + $6.31
Economy Shipping

Remove | Save for later

▶ This listing has been revised. Review the updated listing before purchasing this item.

Seagate Internal Hard Drive ST8000AS0002 8TB 128MB Cache
Condition: New

Quantity: 1 $214.99
                     $299.99
Economy (5 business days) ▾   FREE
Economy Shipping

Remove | Save for later

Seller imicros (118408 ★)   Pay only this seller   Request total from seller ⓘ

Supermicro SuperChassis CSE-825TQ-600LPB 600W 2U Rackmount Server Chassis
Condition: New

Quantity: 1 $407.79

Standard (6 business days)   FREE
UPS Ground

Remove | Save for later

Seller plainmetal (1386★)   Pay only this seller   Request total from seller ⓘ

Matched PAIR INTEL XEON E5-2676 V3 2.40GHz SR1Y5 30Mb 12 Cores 24 Thread E5-2670
Condition: Used
LAST ONE
Added to 4 carts in the last day

Quantity: 1 $1,800.00

Standard Int'l Shipping (9-19 business days)   FREE
Standard Shipping from outside US

Remove | Save for later

Subtotal (6 items): $3,621.72
Shipping to 60616: $6.31

Total: $3,628.03

Continue shopping   Proceed to checkout

---

ebay MONEY BACK GUARANTEE
Covers your purchase price plus original shipping on virtually all items. Get the item you ordered or get your money back. Learn more

About your cart

▶ Are items in my cart reserved for me?

▶ Why are auction or best offer items in my cart?

▶ Where can I see the items I'm bidding on?

▶ If I buy from different sellers, will I need to pay separately?

▶ Can I pay for items from more than one seller or different types of transactions in one payment?

Your saved items

Did you know that you can save items from your cart to buy later?

Just click "Save for later", and it'll be moved here. Remember, these items can still be purchased by other eBay members, so don't wait too long to buy.

About eBay   Announcements   Community   Security Center   Resolution Center   Seller Information Center   Policies   Affiliates   Help & Contact   Site Map

References:

[1] http://aws.amazon.com/ec2/pricing/

[2] http://newegg.com

[3] http://www.ebay.com/itm/Matched-PAIR-INTEL-XEON-E5-2676-V3-2-40GHz-SR1Y5-30Mb-12-Cores-24-Thread-E5-2670-/321956437206?hash=item4af6195cd6:g:H~UAAOSwSHZWelB5

[4] http://downloadmirror.intel.com/18620/eng/intel(r)_Ethernet_server_Adapter_x520-T2_v1p0.pdf

[5] http://www.newegg.com/Product/Product.aspx?Item=N82E16820233232

[6] http://www.amazon.com/Intel-E5-2670-2-60Ghz-8-Core-Processor/dp/B007H29FRS

[7] http://www.ebay.com/itm/Intel-Ethernet-Converged-Network-Adapter-X520-SR2-/121949086937?hash=item1c64bb64d9:g:~UoAAOSwbwlXB0aT

[8] https://pcpartpicker.com/part/asus-motherboard-rampageivblackedition

[9] http://www.pricewatch.com/browse/cases_and_accessories/merchant,newegg.com/merchant,atacom_inc./brand,ultra_computer_products/621

[10] http://www.newegg.com/Product/Product.aspx?Item=9SIA1EA2153755&cm_re=Cisco_Meraki_MX400-_-9SIA1EA2153755-_-Product

[11] http://www.supermicro.com/manuals/brochure/brochure_mb.pdf

[12] http://research.microsoft.com/en-us/um/people/dmaltz/papers/dc-costs-ccr-editorial.pdf