

# **Project Report Document for Understanding the Cost of Computing in the Cloud**

**By  
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**Public Cloud Configuration Estimation:**

- There are 3 configurations for the public cloud.
- We have divided the cost for compute server cost and additional storage server cost.
- For compute server cost we are referring to the Amazon's on demand pricing for the servers for Ohio location.
- For additional storage server cost we are referring to Amazon's S3 instance on demand pricing.
- All the prices are calculated in US dollars.
- Costs are estimated for the 5 years' period.

**Compute server cost calculation:**

**Final cost = (Unit price for instance per hour) \* (total number of instances) \* (total number of hours in 5 years)**

**Storage server cost calculation:**

**Final cost: = (Unit price for instance per month) \* (total number of instances) \* (total number of months in 5 years)**

**Private cloud Configuration Estimation:**

- There are 3 configurations for the public cloud.
- We have calculated the cost as cost for the each below component.
  - I. Compute Servers
  - II. Network Switches
  - III. Network Cables
  - IV. Racks
  - V. Storage Servers
  - VI. Electric Power
  - VII. Cooling
  - VIII. Administration
- The final cost is calculated as the total of cost of each component.
- We have assumed 1 system administrator is needed for every 1000 servers.
- Costs are estimated for the 5 years' period.
- All the prices are calculated in US dollars.

**Cost for each component calculation: (Price for one unit) \* (total number of component required)**

**Final cost = (sum of all cost for each component)**

**Configuration 1: Hadoop/Spark Cluster with 32K-cores, 256TB memory, 50PB HDD, and 10Gb/s Ethernet Fat-Tree network (each VM should be equivalent to the d2.8xlarge instance); in addition to the compute resources, a 100PB distributed storage shared across the entire cloud should be procured, with enough capacity for 100GB/sec throughput.**

## 1. Public Cloud Calculation:

### A. Unit price for AWS instance:

Model	vCPU	Mem (GiB)	Storage (GB)	Networking Capacity	Price (Linux/Unix) per hour
d2.8xlarge	36	244	24 x 2000 HDD	10GB	\$5.52

### B. Number of instances for the Compute server:

Specification Name	For Single Instance	For Computer Server	Total Instances Required
No. of Cores	36 cores	32000 cores	889
Memory	244 GiB	256 TB	1050
HDD	24*2000 GB	50 PB	1042
		Total Number of instances required	1050

### C. Total cost for Compute server:

Unit price for instance per hour	Total number of instances	Total number of hours in 5 years	Total cost
\$5.52	1050	43800	\$ 253,864,800

### D. Total cost for Storage Server:

Unit price for per GB Storage per month	Total Storage for Server	Total number of months in 5 years	Total cost
\$0.021	100,000,000 GB	60	\$ 126,000,000

### E. Final Cost for cluster:

Total Cost for Compute Server	Total Cost for Storage Server	Final Cost
\$ 253,864,800	\$ 126,000,000	\$ 379,864,800

## 2. Private Cloud Calculation:

### A. Compute Server instance required:

Specification Name	For Single Instance	For Computer Server	Total Instances Required
No. of Cores	32 cores	32000 cores	1000
Memory	256 GiB	256 TB	1000
HDD	48 GB	50 PB	1042
		<b>Total Number of instances required</b>	<b>1042</b>

### B. Total Cost:

	Description	Price per Item	Quantity	Total Price
<b>Compute Servers</b>	1. CPU: Intel Xeon Gold 6142 16C 2.6GHz 22MB Cache 2. Memory: 256GB DDR4 2666MHz ECC Reg (8*32GB) 3. HDD: HGST Ultra star HE 12 12TB 7200RPM SAS 12Gb/s * 4	13108.19	1042	<b>13,658,733.98</b>
<b>Network Switches</b>	NETGEAR 48-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS748T)	3,642.72	25	<b>91,068.00</b>
	2. NETGEAR 8-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS708T)	826.69	1	<b>826.69</b>
	3. Intel X550 Dual Port 10G Base-T Adapter	740.06	1150	<b>851,069.00</b>
<b>Network Cables</b>	Ethernet Cable, Vandesail CAT7 LAN Network Cable RJ45 High Speed Patch Cord STP Gigabit 10/100/1000Mbit/s Gold Plated Lead	6	1050	<b>6,300.00</b>
<b>Racks</b>	CRUXIAL-COOL-42u-10K   Rackmount Solutions   Air-Conditioned Racks	3199.98	25	<b>79,999.50</b>
<b>Storage Servers</b>	Storage Enclosure 4U 102 Bay 1020TB	53004	98	<b>5,194,392.00</b>

<b>Electric Power</b>	Electric power consumption cost calculated below	-	-	<b>2,155,993.79</b>
<b>Cooling</b>	Cooling cost calculated below	-	-	<b>230,680.37</b>
<b>Administration</b>	2 Administrators	138170	2	<b>276,340.00</b>
<b>TOTAL</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>22,545,403.33</b>

## C. Electric power cost:

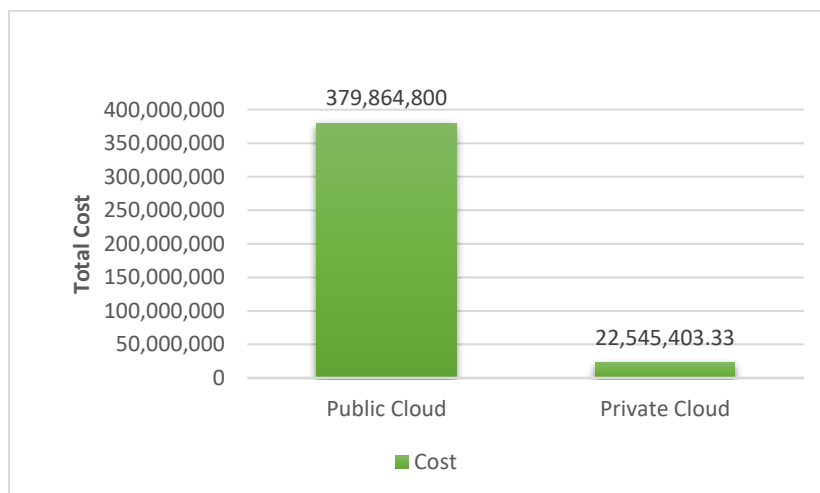
Name	Power supply in Watts	Electricity rate per KWatt	Number of Instances	5-year costing
Compute Server	500W	\$0.0719	1042	1,640,743.62
Switches	262W	\$0.0719	26	21,452.48
Storage Server	1600W	\$0.0719	98	493,797.69
			<b>Total Electric power cost</b>	<b>2,155,993.79</b>

## D. Cooling cost:

Cooling capacity	Total kWatt power consumption in 5 years	Chicago Electricity rate per KWatt	Number of Instances	Total cooling cost
10000BTU(2.93 Kwatt)	128334	\$0.0719	25	<b>230680.365</b>

## Public Vs Private Comparison for configuration 1:

Name	Public Cloud	Private Cloud
<b>Cost</b>	<b>379,864,800</b>	<b>22,545,403.33</b>



## Conclusion:

We can see from the above graph the cost for public cloud is very much higher than the private cloud for 5 years duration. Private cloud option will be better if we are having the very high-end server requirement otherwise there will be the under utilization of the resources. If our requirement is not for the higher end servers then public cloud will be better. Also, we can scale the system easily on public cloud. But we haven't included the hardware failure cost and other infrastructure for private cloud which will increase the private cloud cost. Also, the startup cost for private cloud is higher as compared to public cloud. But as public cloud cost is very much higher private cloud cost will be lesser than it.

**Configuration 2: Support 1 million virtual machines (VM) where each VM requires 2-core, 15GB RAM, 32GB SSD storage, and 1Gb/s Fat-Tree network (each VM should be equivalent to the r3.large instances); in addition to the compute resources, a 10PB distributed storage shared across the entire cloud should be procured, with enough capacity for 10GB/sec throughput.**

### 1. Public Cloud Calculation:

#### A. Unit price for AWS instance:

Model	vCPU	Mem (GiB)	Storage (GB)	Price (Linux/Unix) per hour
r3.large	2	15	32	\$0.18

#### B. Number of instances for the Compute server:

Number of instances for the Compute server
1000000

#### C. Total cost for Compute server:

Unit price for instance per hour	Total number of instances	Total number of hours in 5 years	Total cost
\$0.18	1000000	43800	\$ 7,884,000,000

#### D. Total cost for Storage Server:

Unit price for per GB Storage per month	Total Storage for Server	Total number of months in 5 years	Total cost
\$0.021	10,000,000 GB	60	\$ 12,600,000

**E. Final Cost for cluster:**

Total Cost for Compute Server	Total Cost for Storage Server	Final Cost
\$ 7,884,000,000	\$ 12,600,000	\$ 7,896,600,000

**2. Private Cloud Calculation:****A. Compute Server instance required:**

Number of instances for the Compute server
1000000

**B. Total Cost:**

	Description	Price per Item	Quantity	Total Price
<b>Compute Servers</b>	1.NX236-S2HD - Intel Core i3-6100 3.70GHz 2Core/4Thread 3MB Cache CPU 2. Dogfish SSD 32GB SATA3 III 2.5 Inch Internal Solid-State Drive 7MM	845	1000000	845,000,000.00
<b>Network Switches</b>	NETGEAR 48-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS748T)	3,642.72	20834	75,892,428.48
<b>Network Cables</b>	Ethernet Cable, Vandesail CAT7 LAN Network Cable RJ45 High Speed Patch Cord STP Gigabit 10/100/1000Mbit/s Gold Plated Lead	6	1020834	6,125,004.00
<b>Racks</b>	CRUXIAL-COOL-42u-10K   Rackmount Solutions   Air-Conditioned Racks	3199.98	23810	76,191,523.80
<b>Storage Servers</b>	Storage Enclosure 4U 102 Bay 1020TB	53004	9	477,036.00
<b>Electric Power</b>	Electric power consumption cost calculated below.	-	-	1,172,323,938.56
<b>Cooling</b>	Cooling cost calculated below.	-	-	162,285,910.61
<b>Administration</b>	2 Administrators	138170	1000	138,170,000.00
<b>TOTAL</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>2,476,465,841.45</b>

**C. Electric power cost:**

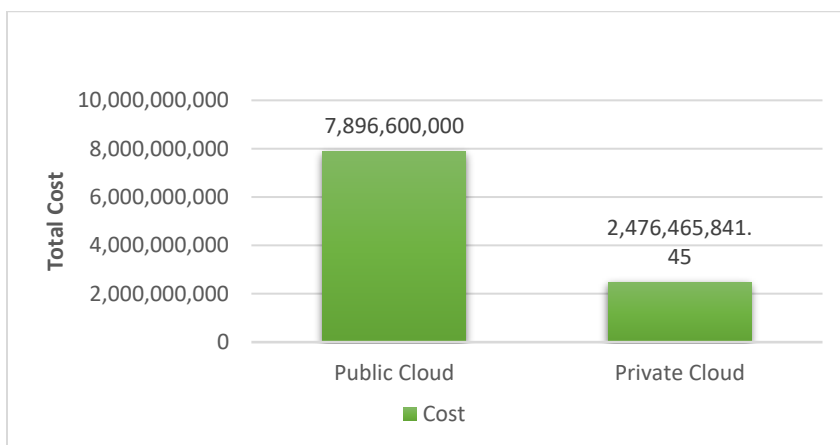
Name	Power supply in Watts	Chicago Electricity rate per kWatt	Number of Instances	5-year costing
Compute Server	350W	\$0.0719	1000000	944,766,000.00
Switches	262W	\$0.0719	220834	182,209,170.56
Storage Server	1600W	\$0.0719	9	45,348,768.00
			<b>Total Electric power cost</b>	<b>1,172,323,938.56</b>

**D. Cooling cost:**

Cooling capacity	Total kWatt power consumption in 5 years	Chicago Electricity rate per KWatt	Number of Instances	Total cooling cost
10000BTU(2.93 Kwatt)	128334	\$0.0719	23810	162285910.61

**Public Vs Private Comparison for configuration 2:**

Name	Public Cloud	Private Cloud
Cost	7,896,600,000	2,476,465,841.45

**Conclusion:**

From graphs we can see that the utilization for the private cloud is smaller than the public cloud. The price for private cloud is higher as we have used the 1 million smaller instances virtual machines. To reduce this cost, we could have used the higher configuration machine instead of one million virtual machines with 2-core, 15GB RAM, 32GB SSD storage. Also, for the public cloud we have calculated the estimation with the 100% utilization. So, we can use private cloud if we need the high-end server configurations with higher utilization whereas if we need the low server configuration with the less utilization then we can opt for the public cloud.



**Configuration 3: Support deep learning with 1 exaflop of mixed precision performance (hint: each VM should be equivalent to p3.16xlarge instances; you will want to use the NVIDIA V100 GPUs (8 GPUs per node), and allocate 8-cores per GPU (64-cores per node) with 8GB of memory per core (512GB per node); the network to use is at least 10Gb/s per GPU (100Gb/s should work), and should be organized in a Fat-Tree network; in addition to the compute resources, a 1PB distributed storage shared across the entire cloud should be procured, with enough capacity for 10GB/sec throughput**

### 1. Public Cloud Calculation:

#### A. Unit price for AWS instance:

Model	vCPU	Mem (GiB)	Storage (GB)	Price (Linux/Unix) per hour
p3.16xlarge	64	488	128	\$ 24.48

#### B. Number of instances for the Compute server:

Specification Name	GPU per instance	Mixed precision performance per instance	Performance required for cluster	Total number of instances
p3.16xlarge	8	125 TFLOPS	1 exaflop	1000

#### C. Total cost for Compute server:

Unit price for instance per hour	Total number of instances	Total number of hours in 5 years	Total cost
\$24.48	1000	43800	\$ 1,072,224,000

#### D. Total cost for Storage Server:

Unit price for per GB Storage per month	Total Storage for Server	Total number of months in 5 years	Total cost
\$0.021	1,000,000 GB	60	\$ 1,260,000

#### E. Final Cost for cluster:

Total Cost for Compute Server	Total Cost for Storage Server	Final Cost
\$ 1,072,224,000	\$ 1,260,000	\$ 1,073,484,000

## 2. Private Cloud Calculation:

### A. Compute Server instance required:

Name	GPU per node	Mixed precision flops	Total mixed precision flops required	Total number of instance required
NVIDIA DGX-1	8	1000TFLOPS	1 EXAFLOPS	1000

### B. Total Cost:

	Description	Price per Item	Quantity	Total Price
<b>Compute Servers</b>	NVIDIA DGX-1	164,986.46	1000	<b>164,986,460.00</b>
<b>Network Switches</b>	Mellanox MSB7700-ES2F 36-port Non-Blocking Managed EDR 100Gb/s InfiniBand Switch Standard Depth	14,927	29	<b>432,883.00</b>
	Mellanox MCX515A-CCAT ConnectX-5 EN Network Interface Card	765	1001	<b>765,765.00</b>
<b>Network Cables</b>	Ipolex 100Gb/s QSFP28 for Mellanox MCP1600-C001, Direct-attach Copper Cable, 1-meter	69.99	1029	<b>72,019.71</b>
<b>Racks</b>	CRUXIAL-COOL-42u-10K   Rackmount Solutions   Air-Conditioned Racks	3199.98	24	<b>76,799.52</b>
<b>Storage Servers</b>	Storage Enclosure 4U 102 Bay 1020TB	53004	1	<b>53,004.00</b>
<b>Electric Power</b>	Electric power consumption cost calculated below.	-	-	<b>10,094,963.27</b>
<b>Cooling</b>	Cooling cost calculated below.	-	-	<b>9,227.21</b>
<b>Administration</b>	1 Administrators	69085	1	<b>69,085.00</b>
<b>TOTAL</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>176,560,206.71</b>

### C. Electric power cost:

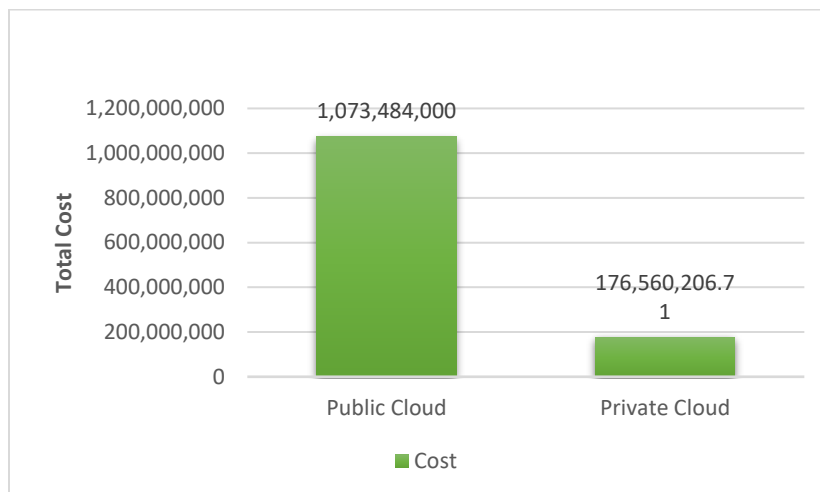
Name	Power supply in Watts	Chicago Electricity rate per kWatt	Number of Instances	5-year costing
<b>Compute Server</b>	3200W	\$0.0719	1000	<b>10,077,504.00</b>
<b>Switches</b>	136W	\$0.0719	29	<b>12,420.52</b>
<b>Storage Server</b>	1600W	\$0.0719	1	<b>5,038.75</b>
			<b>Total Electric power cost</b>	<b>10,094,963.27</b>

**D. Cooling cost:**

	Total kWatt power consumption in 5 years	Chicago Electricity rate per kWatt	Number of Instances	Total cooling cost
Cooling capacity 10000BTU(2.93 Kwatt)	128334	\$0.0719	1	9,227.21

**Public Vs Private Comparison for configuration 3:**

Name	Public Cloud	Private Cloud
Cost	1,073,484,000	176,560,206.71

**Conclusion:**

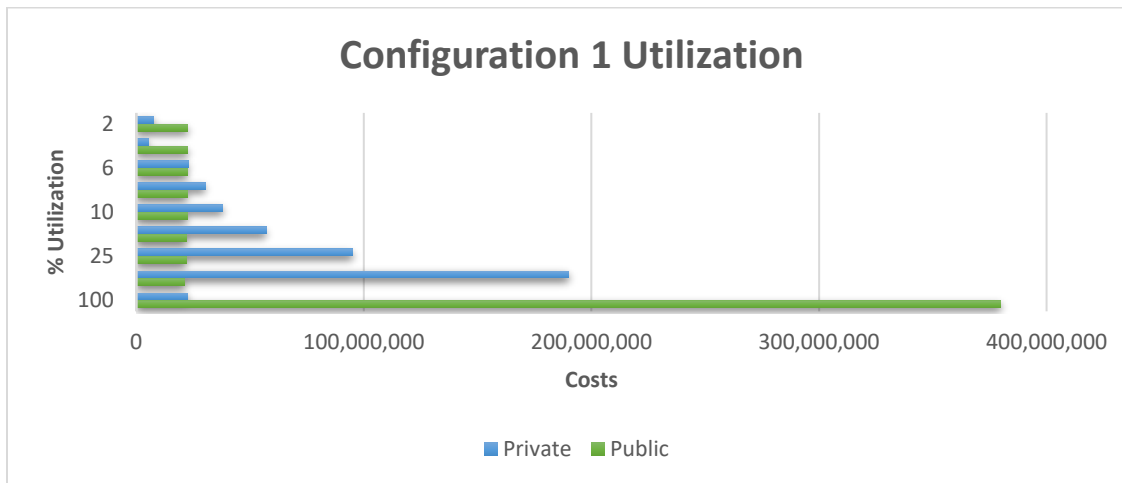
From the graph we can see that the public cloud cost estimation is higher than the private cloud estimation for 5 years of usage. In private cloud cost estimation, we have not considered the hardware failure cost. If we consider that cost, then private cloud cost would be equal or more than cost of public cloud as we are using the costly compute server. Also, for public cloud if reserve the instances for more than 3 years then Amazon will cost the around \$10 per hours. So that will also reduce the cost estimation for the public cloud. In regards with the configuration 1 and 2, in configuration 3 we are having public cloud and private cloud cost difference higher than configuration 1 and lower than configuration 2 as we are using costly GPU servers in large quantity and for configuration 2 we are using the 1 million instances which reduces the gap between the private and public cloud.

## Utilization:

The utilization rate is defined as the total extent to which cluster servers are being used and is usually recorded as a percentage. For public cloud the pricing is hourly basis, so we are considering the utilization for total cost. In private cloud the utilization will be affected only by cost of power, cooling, and administration should be to cover 5 years of costs, so we utilization for private cloud will be affected only by these factors.

### Utilization for configuration 1:

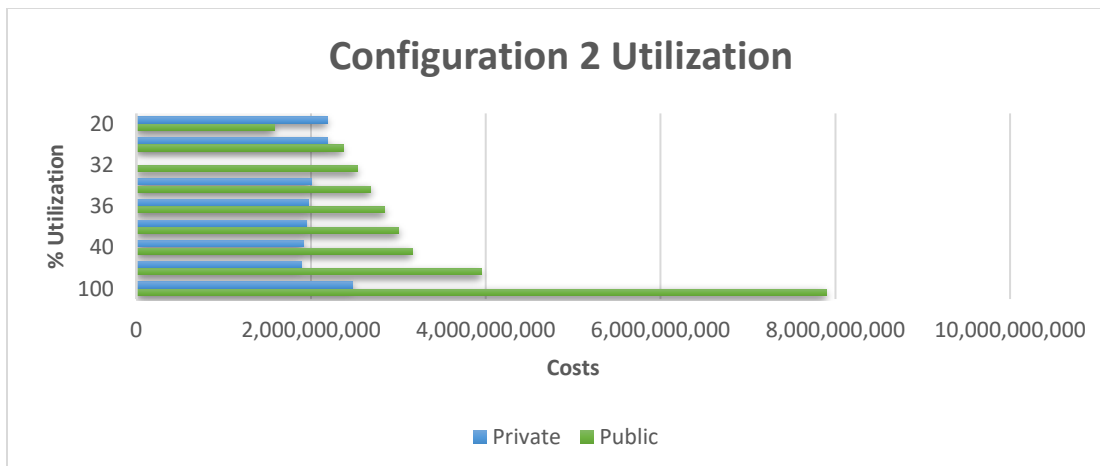
	100%	50%	25%	15%	10%	8%	6%	4%	2%
Public Cloud	379,864,800	21,213,896	21,879,649	22,145,951	22,279,101	22,332,362	22,385,622	22,438,882	22,492,143
Private Cloud	22,545,403	189,932,400	94,966,200	56,979,720	37,986,480	30,389,184	22,791,888	15,194,592	7,597,296



From above graph we can see that utilization is 6% which is very low due the huge difference between the private and public cost estimation.

### Utilization for configuration 2:

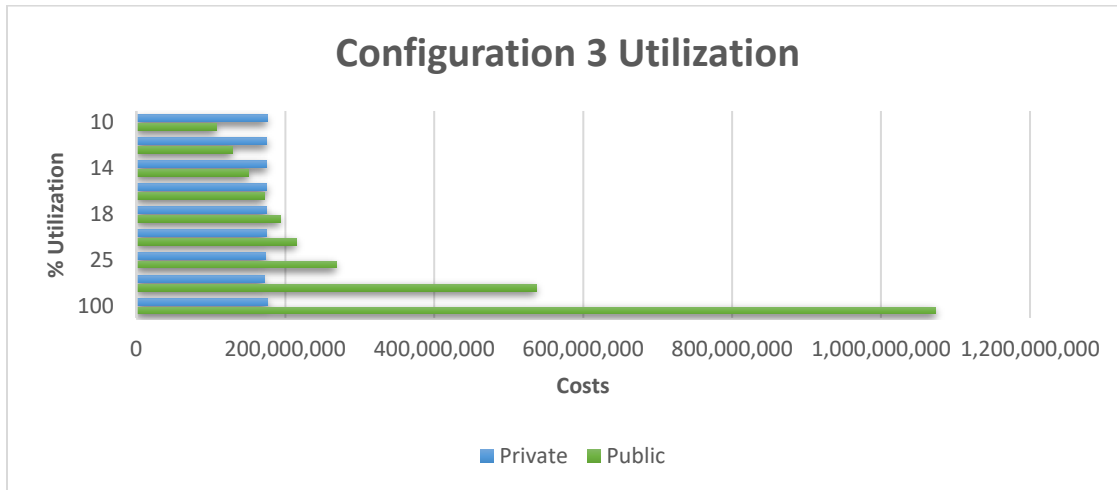
	100%	50%	40%	38%	36%	34%	32%	30%	20%
Public Cloud	7,896,600,000	3,948,300,000	3,158,640,000	3,000,708,000	2,842,776,000	2,684,844,000	2,526,912,000	2,368,980,000	1,579,320,000
Private Cloud	2,476,465,841	1,887,353,901	1,916,809,498	1,946,265,095	1,975,720,692	2,005,176,289	2,034,631,88	2,181,909,871	2,181,909,871



From above graph we can see that utilization is around 30% which is low due the difference between the private and public cost estimation.

#### Utilization for configuration 3:

	100%	50%	25%	20%	18%	16%	14%	12%	10%
Public Cloud	1,073,484,000	536,742,000	268,371,000	214,696,800	193,227,120	171,757,440	150,287,760	128,818,080	107,348,400
Private Cloud	176,560,206	171,473,568	174,016,887	174,525,551	174,729,017	174,932,482	175,135,948	175,339,413	175,542,879



From above graph we can see that utilization is around 16% which is very low due the difference between the private and public cost estimation.

#### Summary Table: Comparing the 3 Configurations between the Public and Private Cloud:

	Configuration 1	Configuration 2	Configuration 3
Public Cloud (including EC2 and S3) Cost over 5 years, 24/7 operation, with 100% usage	379,864,800	7,896,600,000	1,073,484,000
Private Cloud cost over 5 years, 24/7 operation, with 100% usage	22,545,403.33	2,476,465,841.45	176,560,206.71
What utilization must be achieved with the private cloud to make the private cloud option more attractive than the public cloud?	6%	30%	16%

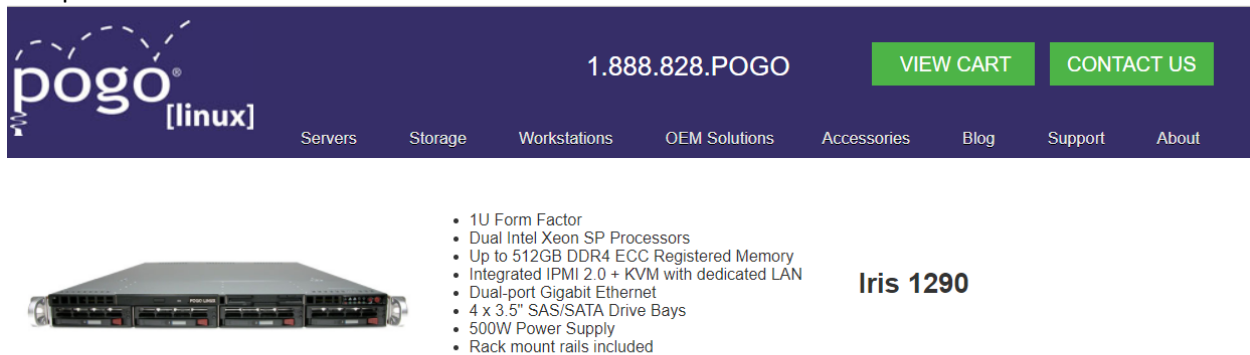
#### Conclusion:

From above table we can see that the configuration 2 has the highest utilization among the 3 configurations. So, we can conclude that if we need the small number of instances with low utilization then we can select the public cloud and if we require the higher number of instances with maximum utilization then we can go for the private cloud.

## Screenshots:

## Configuration 1:

## 1. Computer Node:



The screenshot shows the Pogo Linux website with a dark blue header. The header includes the Pogo Linux logo, the phone number 1.888.828.POGO, and buttons for 'VIEW CART' and 'CONTACT US'. Below the header is a navigation menu with links for Servers, Storage, Workstations, OEM Solutions, Accessories, Blog, Support, and About. The main content area features a server image on the left and a list of specifications on the right for the 'Iris 1290' model. The specifications include: 1U Form Factor, Dual Intel Xeon SP Processors, Up to 512GB DDR4 ECC Registered Memory, Integrated IPMI 2.0 + KVM with dedicated LAN, Dual-port Gigabit Ethernet, 4 x 3.5" SAS/SATA Drive Bays, 500W Power Supply, and Rack mount rails included.

**1.888.828.POGO** **VIEW CART** **CONTACT US**

Servers Storage Workstations OEM Solutions Accessories Blog Support About

**Iris 1290**

- 1U Form Factor
- Dual Intel Xeon SP Processors
- Up to 512GB DDR4 ECC Registered Memory
- Integrated IPMI 2.0 + KVM with dedicated LAN
- Dual-port Gigabit Ethernet
- 4 x 3.5" SAS/SATA Drive Bays
- 500W Power Supply
- Rack mount rails included

## 2. Compute Server:



The screenshot shows the Pogo Linux System Configurator interface. At the top, there are buttons for 'View Specs', 'Save to Wishlist', 'Add to Cart', 'Submit for Review', and 'Request a Quote'. The 'Request a Quote' button is highlighted in green. The price as configured is \$13,108.19. The configuration is divided into sections: 'PROCESSOR AND MEMORY' and 'HARD DISK DRIVES'. Under 'PROCESSOR AND MEMORY', the CPU is configured as 2x Intel Xeon Gold 6142 16C 2.6GHz 22MB Cache (\$0.00) and Memory is 1x 256GB DDR4 2666MHz ECC Reg (8 x 32GB) (\$0.00). Under 'HARD DISK DRIVES', there are four SAS/SATA HDD slots, each configured with 1x HGST Ultrastar HE12 12TB 7200RPM SAS 12Gb/s (\$0.00).

**Pogo Linux System Configurator** *Need help? Chat with us.* Price as configured: **\$13,108.19**

**View Specs** **Save to Wishlist** **Add to Cart** **Submit for Review** **Request a Quote**

**PROCESSOR AND MEMORY**

**CPU**  
2x Intel Xeon Gold 6142 16C 2.6GHz 22MB Cache \$0.00

**Memory**  
1x 256GB DDR4 2666MHz ECC Reg (8 x 32GB) \$0.00

**HARD DISK DRIVES**

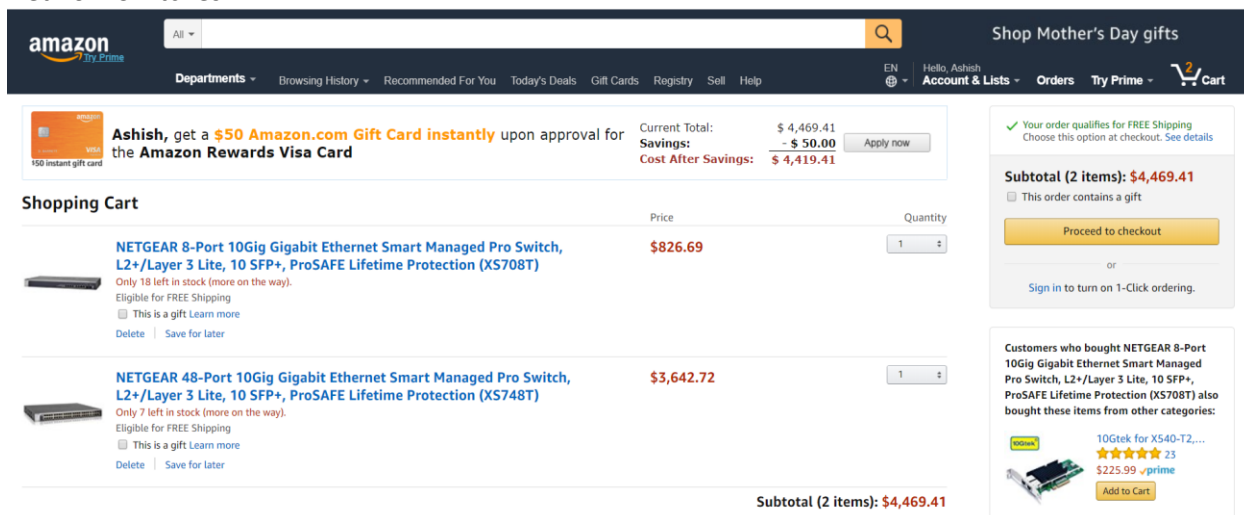
**SAS/SATA HDD 1**  
1x HGST Ultrastar HE12 12TB 7200RPM SAS 12Gb/s \$0.00

**SAS/SATA HDD 2**  
1 HGST Ultrastar HE12 12TB 7200RPM SAS 12Gb/s \$0.00

**SAS/SATA HDD 3**  
1 HGST Ultrastar HE12 12TB 7200RPM SAS 12Gb/s \$0.00

**SAS/SATA HDD 4**  
1 HGST Ultrastar HE12 12TB 7200RPM SAS 12Gb/s \$0.00

## 3. Network Switches:



The screenshot shows the Amazon shopping cart page. At the top, there is a search bar and a 'Shop Mother's Day gifts' button. Below the search bar, there are links for 'Departments', 'Browsing History', 'Recommended For You', 'Today's Deals', 'Gift Cards', 'Registry', 'Sell', and 'Help'. The cart contains two items: a NETGEAR 8-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS708T) for \$826.69 and a NETGEAR 48-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS748T) for \$3,642.72. The subtotal for 2 items is \$4,469.41. There is a promotional banner for a \$50 Amazon.com Gift Card instantly upon approval for the Amazon Rewards Visa Card. The current total is \$4,469.41, with savings of \$50.00, resulting in a cost after savings of \$4,419.41. The page also features a 'Proceed to checkout' button and a 'Sign in to turn on 1-Click ordering' link. A section for 'Customers who bought NETGEAR 8-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS708T) also bought these items from other categories:' is visible at the bottom right, showing a 10Gtek for X540-T2... for \$225.99.

**amazon** All **Shop Mother's Day gifts**

Departments Browsing History Recommended For You Today's Deals Gift Cards Registry Sell Help

EN Hello, Ashish Account & Lists Orders Try Prime Cart

**Ashish, get a \$50 Amazon.com Gift Card instantly** upon approval for the **Amazon Rewards Visa Card**

Current Total: \$ 4,469.41  
Savings: - \$ 50.00  
Cost After Savings: \$ 4,419.41 **Apply now**

**Shopping Cart**

	Price	Quantity
<b>NETGEAR 8-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS708T)</b> Only 18 left in stock (more on the way). Eligible for FREE Shipping This is a gift Learn more Delete Save for later	<b>\$826.69</b>	1
<b>NETGEAR 48-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS748T)</b> Only 7 left in stock (more on the way). Eligible for FREE Shipping This is a gift Learn more Delete Save for later	<b>\$3,642.72</b>	1

**Subtotal (2 items): \$4,469.41**

**Subtotal (2 items): \$4,469.41**  
This order contains a gift  
**Proceed to checkout**  
or  
Sign in to turn on 1-Click ordering.

Customers who bought NETGEAR 8-Port 10Gig Gigabit Ethernet Smart Managed Pro Switch, L2+/Layer 3 Lite, 10 SFP+, ProSAFE Lifetime Protection (XS708T) also bought these items from other categories:

**10Gtek for X540-T2...**  
\$225.99 **prime**  
**Add to Cart**

## 4. Network Adaptors:

**Dell** What can we help you find?

[Products](#) [Solutions & Services](#) [Support](#) [Deals](#) [Chat with Ava](#)

For a limited time, save up to 40% on TVs, monitors, audio and more during the Spring Clearance Sale. [Shop Now](#)

[Home](#) > [For Home](#) > [Accessories](#) > [Networking](#) > ... > [Ethernet Adapters](#) > Intel X550 Dual Port 10G Base-T Adapter, Full Height, Customer Installation

## Intel X550 Dual Port 10G Base-T Adapter, Full Height, Customer Installation

★★★★★ [Write a review](#) [Ask a question](#)


☐ Add to Compare

**Dell**  
Manufacturer Part SPY5X  
Dell Part S40-BBRK

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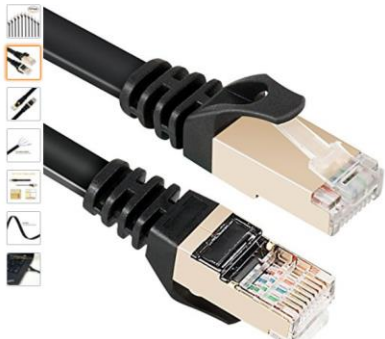
## 5. Network Cables:

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**Vandesail**  
**Ethernet Cable, Vandesail CAT7 LAN Network Cable RJ45 High Speed Patch Cord STP Gigabit 10/100/1000 (3m/ 10ft, Black-10 pack)**  
★★★★★ 1,436 customer reviews | 155 answered questions

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1m/ 3ft 1.8m/ 6ft 2m/ 6.5ft **3m/ 10ft** 5m/ 16ft 10m/ 33ft 15m/ 49ft  
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Color: **Black-10 pack**

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Shipping Method:	LTL Freight
* Estimated Ship Date:	Tues Apr. 24 - Thur Apr. 26

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Storage Options

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0 Patch Cable SFF-8644 to SFF-8644 External JBOD 1M \$63.53

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## 1. Computer Node:

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Product Name	Unit Price	Qty	Subtotal	
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Electronics > Computers & Accessories > Data Storage > Internal Solid State Drives



**Dogfish**  
**Dogfish SSD 32GB SATA3 III 2.5 Inch Internal Solid State Drive 7MM Height MLC SLC Laptop Hard Drive (32GB)**  
 ★★★★★ 16 customer reviews | 5 answered questions  
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Price: **\$25.00**  
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Capacity: **32GB**

32GB	60GB	240GB
\$25.00	\$28.99	\$58.99

- Our products using original MLC chip, more stable performance. An industry-leading 1.75M hours Mean Time To Failure (MTTF) and several error-correction technologies for lasting reliability.
- Dogfish SSD has read speeds of up to 540MB/s and write speeds of up to 500MB/s for faster application response times and boosted transfer speeds, you get the speed to easily run high-end applications like video games, HD media players, or creative software.
- Optimized for multitasking to simultaneously run resource-heavy applications without system slow-down.
- Dogfish SSD go through extensive compatibility and reliability testing, and are certified by DF FIT Labs to work with a wide range of desktop and laptop computers.
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**Brand**

- ☐ Mellanox (15)

**Device Type**

- ☐ Adapter (13)
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**Network Type**


- ☐ 10 Gbase Ethernet (2)
- ☐ 20+ Gbase Ethernet (17)
- ☒ InfiniBand (15)
- ☐ Omni Path (2)

**Port Connector**

- ☐ QSFP (10)
- ☐ QSFP28 (5)

**Port Quantity**

- ☐ up to 16 (2)



**Mellanox MSB7700-ES2F 36-port Non-blocking Managed EDR 100Gb/s InfiniBand Switch Standard Depth**

Product Code: NW-ML-SB7700ES2F  
 Manufacturer: Mellanox  
 Special Order(Non-Refundable)  
 List Price: \$25,633 / Each  
**Your Price: \$14,927 / Each**

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#### 3. Network Card:

**Mellanox MCX515A-CCAT ConnectX-5 EN Network Interface Card 100GbE Single-Port QSFP28 PCIe3.0 x16 Tall Bracket ROHS R6**

Condition: New MPN: MCX515A-CCAT



Availability: **Limited**

List Price: ~~\$1,257.00~~

Our Price: **\$765.00**

Savings: (You save \$492.00)

Technology: Ethernet

Max Speed: 100GbE

Ports: Single

Connector Type: QSFP28/QSFP+/QSFP

PCI: PCIe3.0 x16

Condition: New

ECCN: 5A991

Quantity:

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3.30 ft.

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- AWG 30

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