PROJECT REPORT

RITEN CHHATRALA- rchhatarala@hawk.iit.edu (A20385102)

PREYANG SHAH- pshah115@hawk.iit.edu (A20385823)

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

All the prices in US Doller.

❖ Public Cloud Configuration Calculations:

To calculate the total cost of given 3 configurations on AWS public cloud, we are taking below point into consideration.

- We are calculating two type of server cost. 1) Compute server cost and 2) Storage Server Cost
- To calculate the Compute server cost, we are taking compute on demand instance of AWS EC2 which is provided in project proposal.
- To calculate given shared storage on public cloud we are using pricing of amazon s3.
- All costs are calculated on 5-year time.

1) Calculation Step for Compute Server:
    a. Calculate the number of required instances from given data
    b. Calculate the total price by using below formula.

        Total Cost = (Number of Instance Required) X (Total Number of Hr in 5 year) X (Unit Price per Hr per Instance)

2) Calculation Step for Storage Server:
    a. On amazon S3 per GB/month storage price is given. So need to calculate the Storage in GB and apply below formula.

        Total Cost = (Total Shared Storage Required in GB) X (Number of month) X (Unit price per Gb / month)

❖ Private Cloud Configuration Calculations:

To calculate the total cost of given 3 configurations on Private Cloud, we are calculating prices for below system components.

a. Compute Server
b. Network Switch
c. Network Adaptor Card (if required)
d. Network Cables
e. Racks
f. Storage Server
g. Electricity Power
h. Cooling cost
i. Administration Cost

Assumption:

1. For Administration we are taking 1 system admin per 1000 servers.
2. Power rate is based on Chicago rate.

3. While configuring compute server and storage server we always try to optimize the uses of the servers such that minimum number of server will remain ideal.
4. We use Fat tree network for connection of the compute and storage server. We used fat tree as explained in class i.e. From each lower level switch only one connection goes to upper level switch. It might reduce the performance as this approach is blocking connectivity approach. Generally, in industry fat tree configuration, number of lower connection from switch and number of upper connection from switch are equal with non-blocking approach which will gives you best performance.

Cost Calculation Procedure:

For every system component (Compute server, Storage Server, Network Switch, cable etc.) we try to find the unit price first then we will calculate how many number of each component needed to achieve the given configuration. So,

Total Cost for Each Component = (Quantity) X (Price Per Item)

Total Private Cloud Cost = ∑ (Total Cost for Each Component)

Configuration-1:

➢ Public Cloud Calculation:

1. Amazon Instance Configuration:

AWS Instance Detail					
Name	**VCPU**	**ECU**	**Memory(GiB)**	**Instance Storage(GB)**	**Price (Linux/Unix) Per Hr**
d2.8xlarge	36 Core	116	244	24 x 2000 HDD = 48000 HDD	$5.52 per Hour

2. Calculate Number of Computer Server Required:

Compute Server			
Name	**Per Instance**	**Total Required For Cluster**	**No of Instance Required**
CPU Core	36 Core	32000 Core	889
Memory(GiB)	244 GiB	256000 GiB	1050
Storage(TB)	48 TB	50000 TB	1042
		Total Required Instance For Cluster	1050

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

3. Total Cost for Compute Server:

Compute Server Total Cost			
Total No of Instance Required	Unit Price Per Hr	No of Hr in 5 Year	Total Cost
1050	$5.52	43800	**$253,864,800**

4. Total Cost for Storage Server:

Storage Server					
Name	Total sharded Storage Required For Cluster	Storage Required In GB	Unit Price GiB/ month	Number of Month	Total Price
Storage on AWS S3	100 PB	100,000,000	0.021	60	**$126,000,000**

5. Total Cost For Public Cloud:

Total Cost for Configuration-1 on Public Cloud	
Name	Total Price
Compute Server Cost	$253864800
Storage Server Cost	$126000000
Total Cost	**$379,864,800**

➢ Private Cloud:

1. Calculate Number of Compute Server Required:

Compute Server			
Name	Per Instance	Total Required For Cluster	No of Instance Required
CPU Core	32 Core	32000 Core	1000
Memory(GiB)	256 GiB	256000 GiB	1000
Storage(TB)	48 TB	50000 TB	1042
		Total Required Instance For Cluster	1042

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

2. Calculate the Cooling Cost:

We took Air-conditioned rack whose capacity is 7000BTU. So, we are calculating the power cost for each rack and multiply them with number of rack.

Cooling Calculation

Capacity of One Rack	Total KW power Required over 5 year	Total KW	Chicago Rate	Unit Cooling Price	Number Of Rack	Total
7000BTU	7000 BTU equals 2.0514 KWh (2.0514 * 24 * 365 * 5) = 89790	89790	$0.08	$7183.2	25	**$179580**

3. Power Calculation:

Power Calculation

Name	Power Supply per Unit in Watt	Chicago Rate $	Yearly Rate $	5 Year Rate $	No of Units	Total $
Compute Server	600	0.08	419.75	2098.75	1042	2186898
Switch	135	0.08	94.9	474.5	27	12811.5
Storage Server	2000	0.08	1401.6	7008	139	974112
					Total	**3173821**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

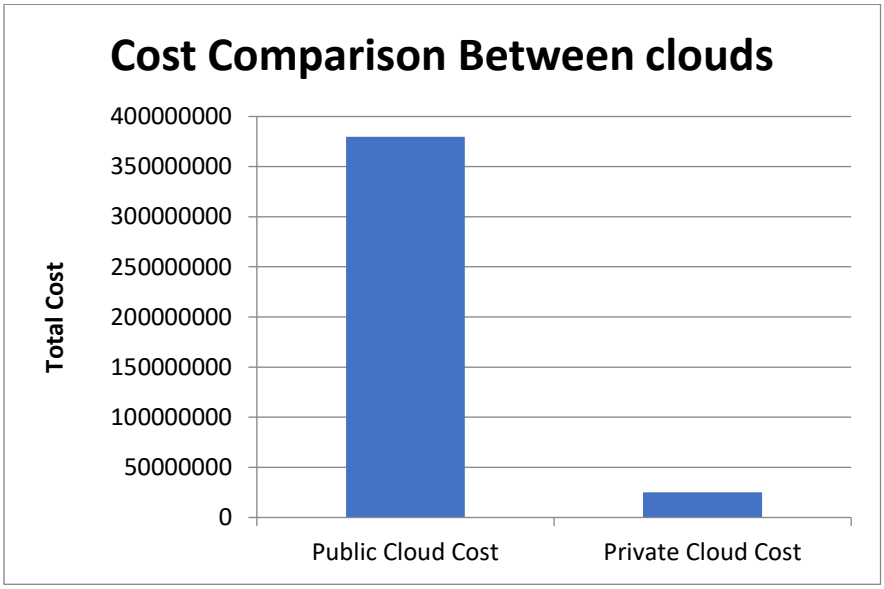
4. Total Cost from Private Cloud:

Configuration - 1				
	Description	**Price per Item $**	**Quantity**	**Total Price $**
Compute Servers	Instance Description: 1) CPU :- Intel Xeon Platinum 8180M 32VCPU 2.5GHz 38.5MB Cache, (2) Memory :- 256GB DDR4 2666MHz ECC Reg(8X32), (3) 4 X HGST Ultrastar HE12 12TB 7200RPM SAS 12Gb/s HDD (Iris 1291)	14149.41	1042	**14743685.2**
Network Switches	NETGEAR ProSAFE 48-Port 10-Gigabit Ethernet Smart Managed Switch (XS748T-100NES)	3735.66	26	97127.16
	NETGEAR ProSAFE 8-Port 10-Gigabit Ethernet Smart Managed Switch (XS708T-100NES)	819.99	1	819.99
	Total			**97947.15**
Network Adaptor Card	DELL 5PY5X INTEL X550 10GB ETHERNET CONVERGED NETWORK ADAPTER WITH LOW PROFILE BRACKET. BRAND NEW. IN STOCK.	315	1181	**372015**
Network Cables	Ethernet Cable, Vandesail CAT7 LAN Network Cable RJ45 High Speed Patch Cord STP Gigabit 10/100/1000Mbit/s Gold Plated Lead for Switch/Router/Modem/Patch Panel (2m/ 6.5ft, Black-10 pack)	4	1069	**4276**
Racks	CRUXIAL-COOL-42u | Rackmount Solutions | Air Conditioned Racks	2,399.99	25.00	**59999.75**
Storage Servers	Storage Server: 1) J4601S :- HGST 4U 60 Bay JBOD with 60 X 12TB Heallium SAS HDD (Kepler)	44,249.00	139	**6150611**
Electric Power	Electic Power Calculation for Compute Server + Storage Server + Switch is shown below			**3173821**
Cooling	Cooling Only Required in rack only. Calculation shown Below	7183.2	25	**179580**
Administration	Total compute and Storage Instance = 1181. So we need 2 administrator.	150000	2	**300000**
			Total	**$25,081,935**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

Comparison:

	Total Cost $
Public Cloud Cost	379864800
Private Cloud Cost	25081935.12



Calculation: -

From the above Graph and table we can see that the private cloud cost is very lower then the public cloud over the five year with 100% utilization. So, from this comparison we can say that if we have very high end system with less number of server then private cloud is very much better as private cloud has less maintenance and administration cost. Here, we are getting very huge difference between private and public cloud cost because we are not calculating the infrastructure cost and failure system component maintenance cost. This kind of facture will increase private cloud cost very much but still private cloud is good option for less number of server required.

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

Configuration-2:

➢ Public Cloud Calculation:

1. Amazon Instance Configuration Description:

AWS Instance Detail					
Name	VCPU	ECU	Memory(GiB)	Instance Storage(GB)	Price (Linux/Unix) Per Hr
r3.large	2	6.6	15	1 x 32 SSD = 32 SSD	$0.17

2. Given Number of Computer Server:

Compute Server	
Total Required Instance For Cluster	1000000

3. Total Cost for Compute Server:

Compute Server Total Cost			
Total No of Instance Required	Unit Price Per Hr	No of Hr in 5 Year	Total Cost $
1000000	0.166	43800	7,270,800,000

4. Total Cost for Storage Server:

Storage Server					
Name	Total shared Storage Required For Cluster	Storage Required In GB	Unit Price GiB/ month	Number of Month	Total Price $
Storage on AWS S3	10 PB	10,000,000	0.021	60	12,600,000

5. Total Cost For Public Cloud:

Total Cost for Configuration-2 on Public Cloud	
Name	Total Price $
Compute Server Cost	7270800000
Storage Server Cost	12600000
Total Cost	7,283,400,000

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

➢ Private Cloud:

1. Calculate Number of Compute Server Required:

Compute Server	
Total Required Instance For Cluster	1000000

2. Calculate the Cooling Cost:

We took Air-conditioned rack whose capacity is 7000BTU. So we are calculating the power cost for each rack and multiply them with number of rack.

Cooling Calculation

Capacity of One Rack	Total KW power Required over 5 year	Total KW	Chicago Rate $	Unit Cooling Price $	Number Of Rack	Total $
7000BTU	7000 BTU equals 2.0514 KWh (2.0514 * 24 * 365 * 5) = 89790	89790	0.08	7183.2	23810	**171031992**

3. Power Calculation:

Power Calculation

Name	Power Supply per Unit in Watt	Chicago Rate $	Yearly Rate $	5 Year Rate $	No of Units	Total $
Compute Server	350	0.08	245.448	1227.24	1000000	1227240000
Switch	66	0.08	46.2845	231.4225	21741	5031356.57
Storage Server	2000	0.08	1402.56	7008	14	98112
					Total	**1232369469**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

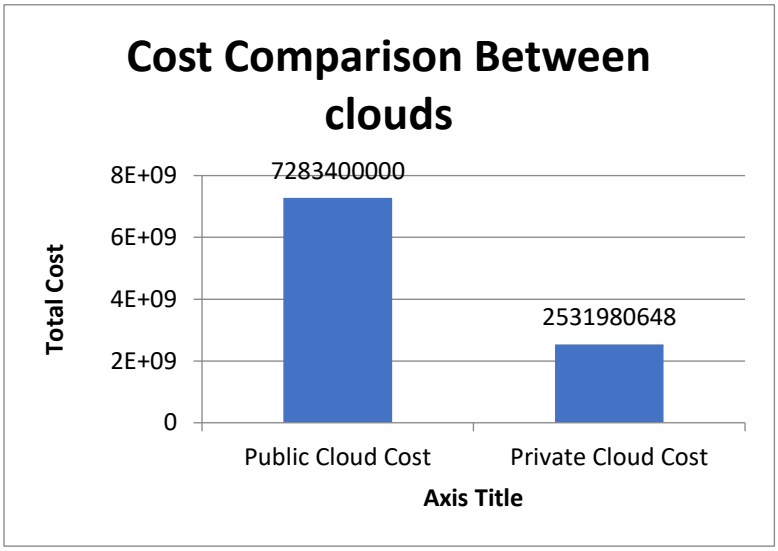
4. **Total Cost from Private Cloud:**

Configuration - 2				
	Description	**Price per Item $**	**Quantity**	**Total Price**
Compute Servers	Instance Description: 1) 1 x Intel Core i3-6100 3.70GHz 2Core/4Thread 3MB Cache CPU, (2) Memory :- 1 x 16GB (2x 8GB) DDR4 PC17000 (2133MHz), (3) Samsung 32GB Internal (MZMPC032HBCD) SSD	910	1000000	**910000000**
Network Switches	NETGEAR ProSAFE 48-Port 10-Gigabit Ethernet Smart Managed Switch (XS748T-100NES)	380	21741	**8261580**
Network Cables	Ethernet Cable, Vandesail CAT7 LAN Network Cable RJ45 High Speed Patch Cord STP Gigabit 10/100/1000Mbit/s Gold Plated Lead for Switch/Router/Modem/Patch Panel (2m/ 6.5ft, Black-10 pack)	2.5	1021744	**2554360**
Racks	CRUXIAL-COOL-42u | Rackmount Solutions | Air-Conditioned Racks	2,399.99	23,810.00	**57143761.9**
Storage Servers	Storage Server: 1) J4601S:- HGST 4U 60 Bay JBOD with 60 X 12TB Helium SAS HDD (Kepler)	44,249.00	14	**619486**
Electric Power	Eclectric Power Calculation for Compute Server + Storage Server + Switch is shown below			**1232369469**
Cooling	Cooling Only Required in rack only. Calculation shown Below	7183.2	25	**171031992**
Administration	Total compute and Storage Instance = 1181. So we need 2 administrator.	150000	1000	**150000000**
			Total	**$2,531,980,648**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

Comparison:

	Total Cost
Public Cloud Cost	$7283400000
Private Cloud Cost	$2531980648



Conclusion: -

From the above Graph and table we can see that the private cloud cost is lower then the public cloud over the five year with 100% utilization.

But here if we pay 3 year cost of cluster to amazon upfront then it will reduce the cost of cluster from 7billion to 5billion approx as amazon will reduce per hr cost of instance. From the above graph we can see that price gap between private and public cloud is not as much as first configuration. This happens because in this configuration we have large number(1million) of low end severs which increase the administration cost. If we will consider infrastructure cost into consideration then this gap may get narrower as we need huge infrastructure to accommodate these many servers.

We can also take another approch in which we can configure high end server (56 core,448 GB memory, 1TB SSD) that will accommodate 15 to 30 low end server(2 Core, 16GB memory, 32GB SSD) in one. So, by doing this, it will reduce the total number of server in cluster which will eventually reduce the administration cost and it will also reduce the infrastructure cost. But we are taking 1million small server as given in the project proposal.

So, from all this discussion we can say that if we require small number of total server with high end configuration we can go with the private cloud and if we want very large number of

low end server with low utilization then we can go with the public cloud. Utilization is also big factor in public private cloud choice decision.

Configuration-3:

➢ Public Cloud Calculation:

1. Amazon Instance Configuration:

AWS Instance Detail					
Name	VCPU	ECU	Memory(GiB)	Instance Storage(GB)	Price (Linux/Unix) Per Hr
p3.16xlarge	64	188	488	EBS Only	$24.48 per Hour

2. Calculate Number of Computer Server Required:

Compute Server					
Name	GPU Per Instance	Performance/ GPU(TFlops)	Total PerFormance for each instance	Total Required Performance of cluster	Total Number of Insatnce Required
p3.16xlarge	8	125	1000	1 Exa Flop = 1,000,000 Tflops	1000

3. Total Cost for Compute Server:

Compute Server Total Cost			
Total No of Instance Required	Unit Price Per Hr	No of Hr in 5 Year	Total Cost $
1000	$24.48	43800	**1,072,224,000**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

4. Total Cost for Storage Server:

Storage Server					
Name	Total sharded Storage Required For Cluster	Storage Required In GB	Unit Price GiB/ month	Number Of Month	Total Price
Storage on AWS S3	1 PB	1,000,000	$0.021	60	**$1,260,000**

5. Total Cost for Public Cloud:

Total Cost for Configuration-3 on Public Cloud	
Name	Total Price $
Compute Server Cost	1072224000
Storage Server Cost	1260000
Total Cost	**$ 1,073,484,000**

➢ Private Cloud:

1. Calculate Number of Compute Server Required:

Compute Server					
Name	GPU Per Instance	Performance/ GPU(TFlops)	Total PerFormance for each instance	Total Required Performance of cluster	Total Number of Insatnce Required
DGX-1 Box	8	125	1000	1 Exa Flop = 1,000,000 Tflops	1000

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

2. Calculate the Cooling Cost:

We took Air-conditioned rack whose capacity is 7000BTU. So we are calculating the power cost for each rack and multiply them with number of rack.

Cooling Calculation

Capacity of One Rack	Total KW power Required over 5 year	Total KW	Chicago Rate $	Unit Cooling Price $	Number Of Rack	Total $
7000BTU	7000 BTU equals 2.0514 KWh (2.0514 * 24 * 365 * 5) = 89790	89790	0.08	7183.2	50	**359160**

3. **Power Calculation:**

Power Calculation

Name	Power Supply per Unit in Watt	Chicago Rate $	Yearly Rate $	5 Year Rate $	No of Units $	Total $
Compute Server	3200	0.08	2241.1	11205.5	1000	11205500
Switch	281	0.08	197.1	985.5	30	29565
Storage Server	2000	0.08	1401.6	7008	2	14016
					Total	**11249081**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

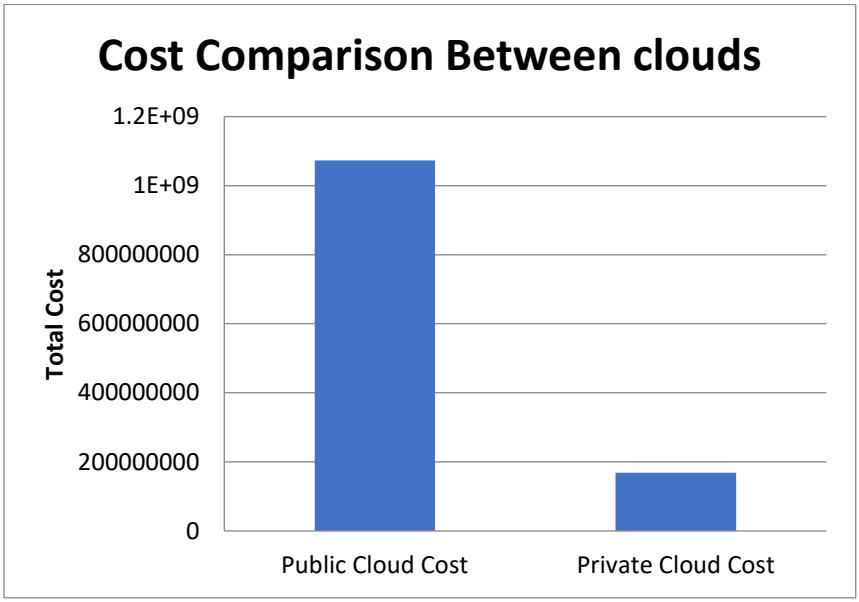
4. **Total Cost from Private Cloud:**

Configuration - 3				
	Description	**Price per Item $**	**Quantity**	**Total Price**
Compute Servers	8-GPU/512GB DGX-1 DL WITH V100	154,766.06	1000	**154766060**
Network Switches	Mellanox SB7700 36-port Non-blocking Managed EDR 100Gb/s InfiniBand Switch - Part ID: MSB7700-ES2F	13,875.00	30	**416250**
Network Adaptor Card	Mellanox MCX415A-CCAT ConnectX-4 EN Network Interface Card 100GbE Single-Port QSFP28 PCIe3.0 x16 ROHS R6	815	1002	**816630**
Network Cables	Mellanox MCP1600-E003 Passive Copper Cable IB EDR up to 100Gb/s QSFP LSZH 3m 26AWG	135	1031	**139185**
Racks	CRUXIAL-COOL-42u | Rackmount Solutions | Air Conditioned Racks	2,399.99	50.00	**119999.5**
Storage Servers	Storage Server: 1) J4601S :- HGST 4U 60 Bay JBOD with 60 X 10TB Heallium SAS HDD (Kepler)	39220.62	1	**39220.62**
	Storage Server: 1) J4601S :- HGST 4U 60 Bay JBOD with 60 X 8TB Heallium SAS HDD (Kepler)	33278.25	1	**33278.25**
Electric Power	Electic Power Calculation for Compute Server + Storage Server + Switch is shown below			**11249081**
Cooling	Cooling Only Required in rack only. Calculation shown Below			**359160**
Administration	Total compute and Storage Instance = 1181. So we need 2 administrator.	150000	2	**300000**
			Total	**$168,238,864**

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

Comparison:

	Total Cost $
Public Cloud Cost	1073484000
Private Cloud Cost	168238864.4



Conclusion: -

From the above Graph and table we can see that the private cloud cost is lower then the public cloud over the five year with 100% utilization.

So, from this comparison we can say that if we have very high end GPU system with less number of server then private cloud is very much better as private cloud has less maintenance and administration cost.

Here, We are getting the pricing gap between public cloud and private cloud higher compare to configuration-1 and lower than configuration-2. Reason behind this is that 1) in configuration-1 and configuration-3 we have almost same number of severs but in configuration-3 we have very high end latest GPU which cost is very high but public cloud provides uses high virtualization which will reduce the cost slightly. 2) In configuration-2 we have 1million instance which cost high administration cost so lower the gap between public cloud cost and private cloud cost.

So, its better to use the private cloud if we require less server with high utilization.

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

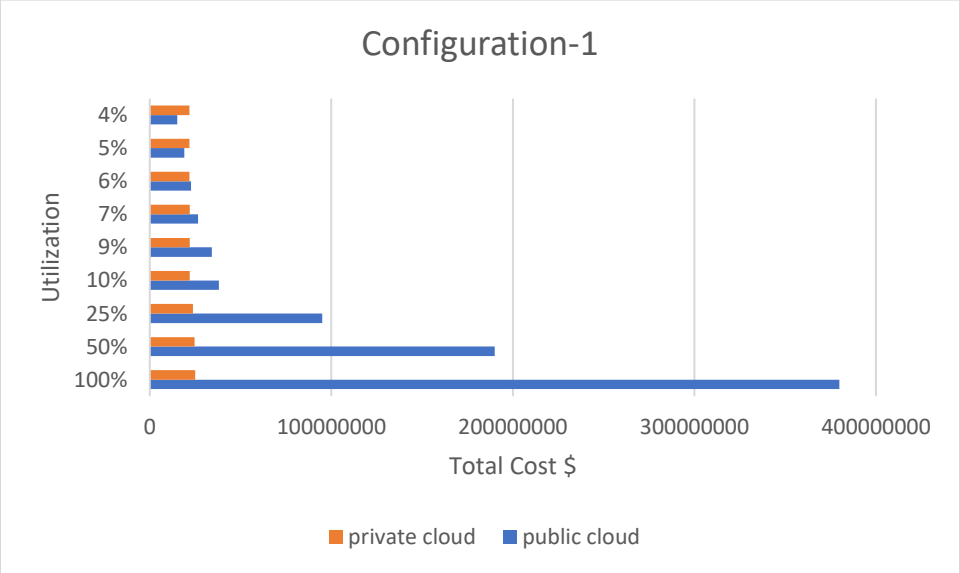
Utilization

Utilization is very important factor in while deciding between private and public cloud. Most of the time cloud resources remain under-utilized. Below is graphical and Tabular view of our utilization for different configuration on private and public cloud.

- Public Cloud:
  - Public cloud provides on demand instance on hour bases. So, in utilization calculation we reduce the total price to percentage of utilization.
- Private Cloud:
  - In private cloud only power and cooling cost will be affected by utilization. So, we only took power and cooling cost in utilization calculation.

Configuration-1:

	100%	50%	25%	10%	9%	7%	6%	5%	4%
public cloud $	379864800	189932400	94966200	37986480	34187832	26590536	22791888	18993240	15194592
private cloud $	25081935.12	24631930.33	23744879.3	22063874.22	22030340.2	21963272.2	21929738.2	21896204.17	21862670.16



Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

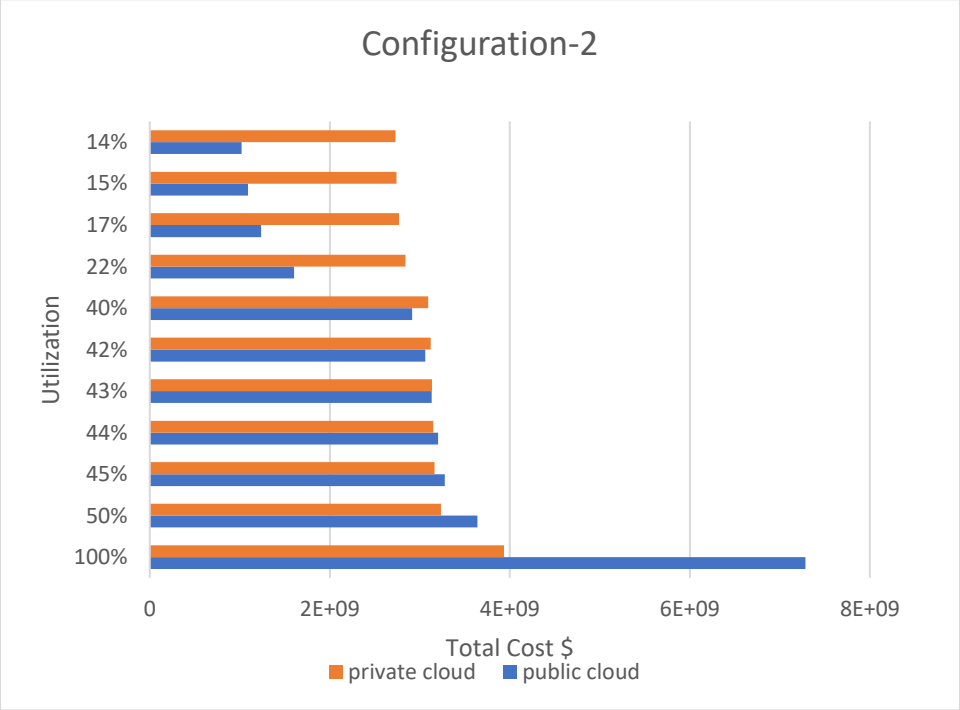
Conclusion:

- For configuration-1, as per above table we can say that if system utilization is less than 6% then it is advisable that you should use public cloud instead of private cloud as the total cost for configuring the system is higher in private cloud compare to public cloud.
- In public cloud, we utilize the resources on hourly bases which means that If we utilize less resources then we need to pay less. While in private cloud, if we reduce system utilization only the power and cooling cost may reduce but other costs (server, storage etc.) are the same as we own the resources.
- As there is huge difference in total cost between private and public cloud, the utilization is very low i.e. 6%.

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

➢ Configuration: -2

	100%	50%	45%	44%	43%	42%	40%	22%	17%	15%
public cloud $	7283400000	3641700000	3277530000	3204696000	3131862000	3059028000	2913360000	1602348000	1238178000	1092510000
private cloud $	3935382109	3233681379	3163511305	3149477291	3135443276	3121409262	3093341232	2840728969	2770558896	2742490867



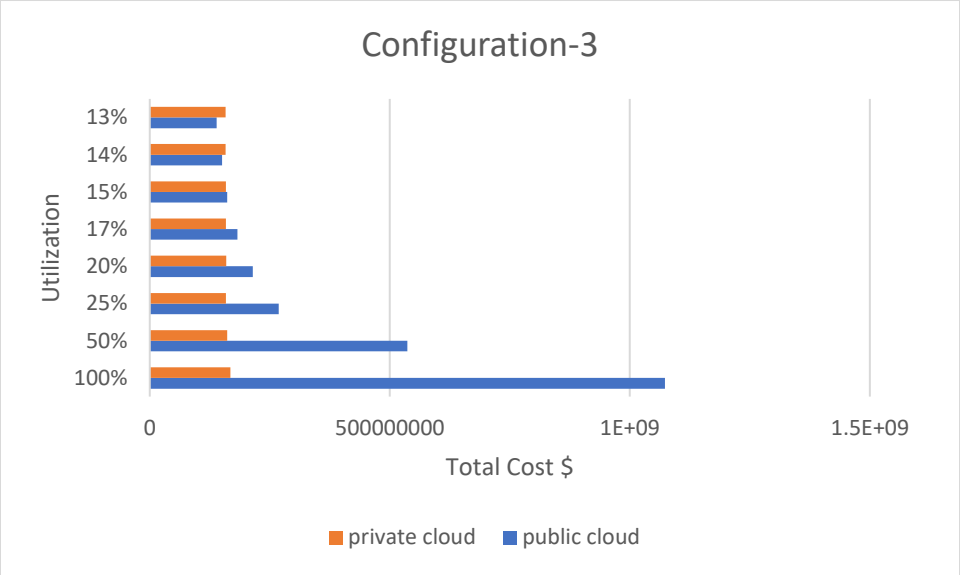
Conclusion:

- For configuration-2, as per above table we can say that if system utilization is less than 44% then it is advisable that you should use public cloud instead of private cloud as the total cost for configuring the system is higher in private cloud compare to public cloud.
- In public cloud, we utilize the resources on hourly bases which means that If we utilize less resources then we need to pay less. While in private cloud, if we reduce system utilization only the power and cooling cost may reduce but other costs (server, storage etc.) are the same as we own the resources.
- As there is more difference in total cost between private and public cloud, the utilization is 44%.

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

➢ Configuration:- 3

	100%	50%	25%	20%	17%	15%	14%	13%
public cloud $	1073484000	536742000	268371000	214696800	182492280	161022600	150287760	139552920
private cloud $	168238864.4	161500794.4	158598733	158952271.6	158604024	158371860	158255777	158139694.7



Conclusion:

- For configuration-3, as per above table we can say that if system utilization is less than 15% then it is advisable that you should use public cloud instead of private cloud as the total cost for configuring the system is higher in private cloud compare to public cloud.
- In public cloud, we utilize the resources on hourly bases which means that If we utilize less resources then we need to pay less. While in private cloud, if we reduce system utilization only the power and cooling cost may reduce but other costs (server, storage etc.) are the same as we own the resources.
- As there is huge difference in total cost between private and public cloud, the utilization Is 15%.

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

Summary: -

	Configuration1	Configuration2	Configuration3
Public Cloud (including EC2 and S3) Cost over 5 years, 24/7 operation, with 100% usage	379864800	7283400000	1073484000
Private Cloud cost over 5 years, 24/7 operation, with 100% usage	25081935.12	3935382109	168238864.4
What utilization must be achieved with the private cloud to make the private cloud option more attractive than the public cloud?	6%	44%	15%

Summary:

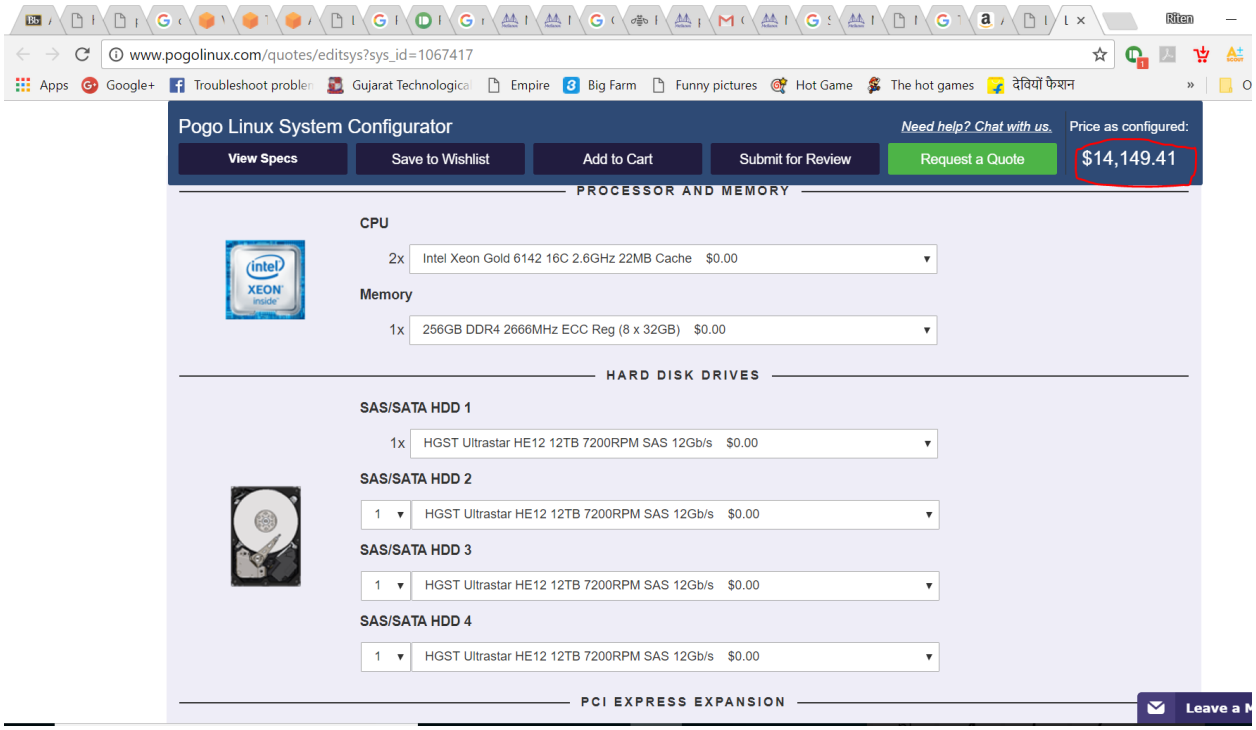
From the above summary table, we can see that if our utilization is more then 44% in any configuration then we suppose to go with the private cloud. Most of the time cloud utilization will remain less than 50% in industry. From the first two row we can see that the cost of private cloud is very low compare to public cloud with 100% utilization. So from all this discussion we can say that if our utilization is low (<44%) and if we requires more number of small instances(configuration-2) then we can use public cloud where as in other two configurations in which we have low number of instances, we get utilization(6% and 15%) percentage at which public cloud is better so for those configuration we advise to use private cloud.

Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

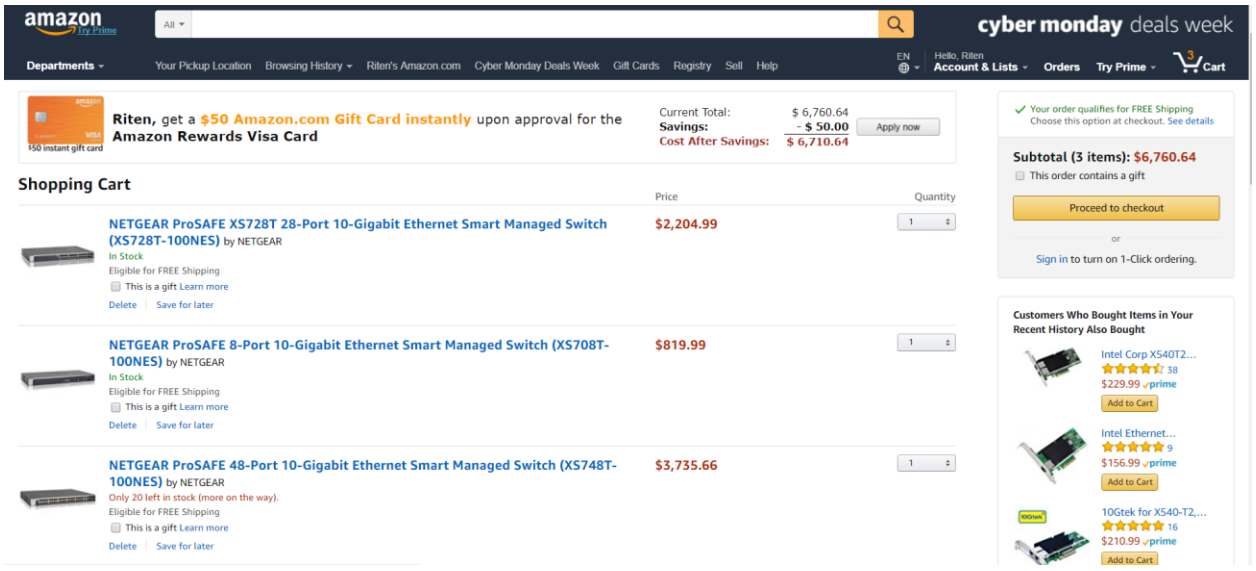
Screen Shot:

1) Configuration-1:

a. Compute Server:

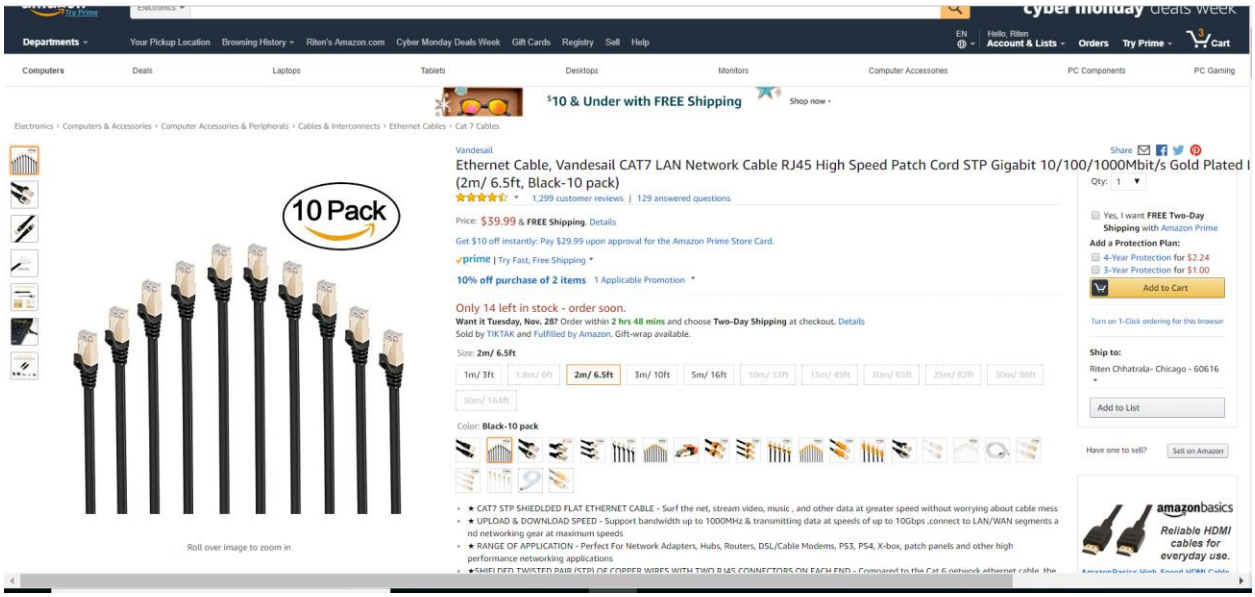


b. Network Switch:

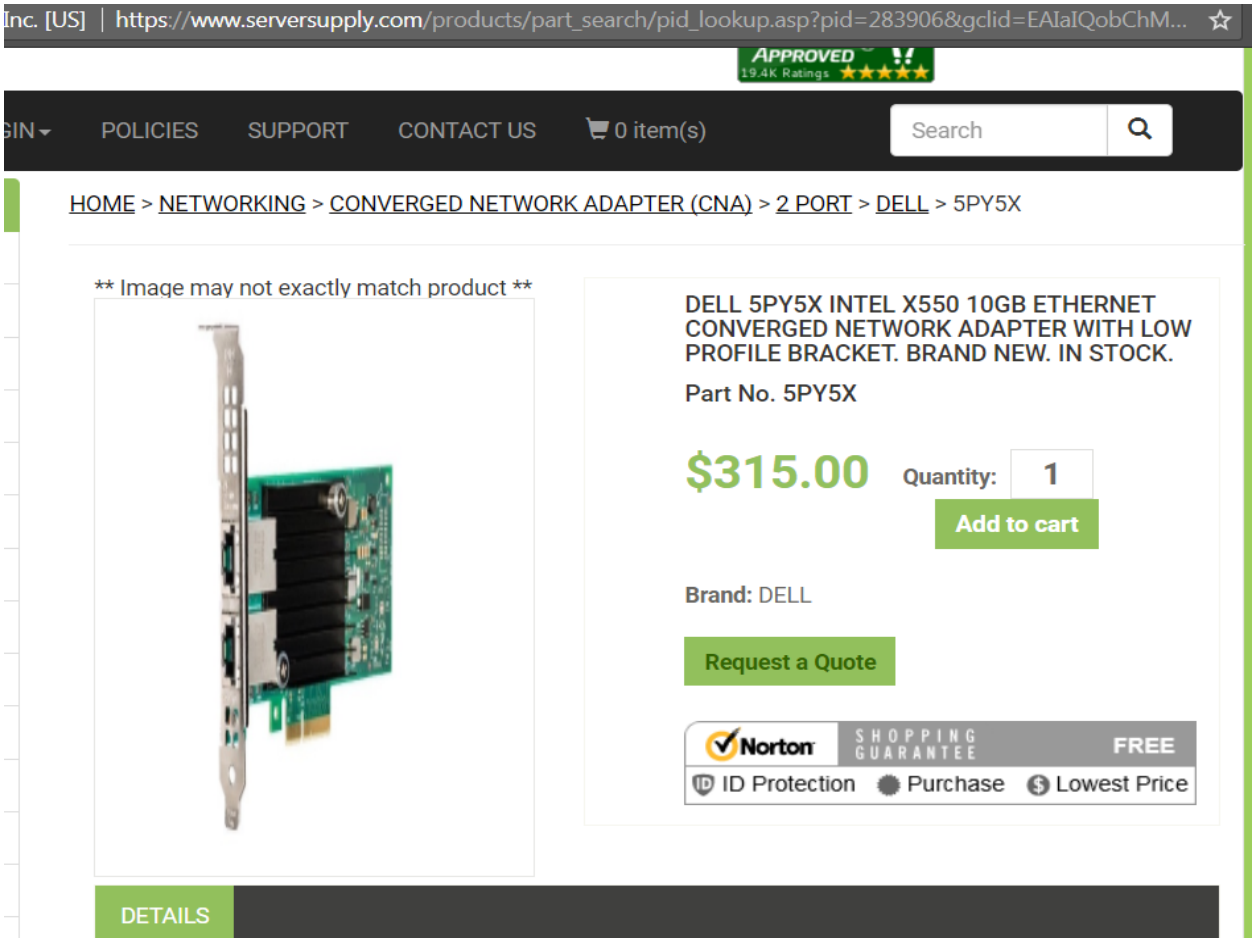


Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

c. Network Cable:



d. Network Card



Riten Chhatrala (rchhatrala@hawk.iit.edu)
Preyang Shah (pshah115@hawk.iit.edu)

Storage Server:

- Up to 60 HGST Ultrastar® drive modules
- 2 x SAS QSFP+ receptacles per IO Module
- Hot Swappable power supplies
- Hot Swappable SAS IO Modules
- SAS 3.0 support for operation up to 12Gbps
- Cable management arm Included
- Enclosure Services (SES-3)
- Comprehensive 5-year warranty on the entire assembly (not just the drives)

J4601S

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STORAGE OPTIONS

Storage Options

1x HGST 4U 60 Bay JBOD with 60 x 12TB Helium SAS HDD (Kepler +) $0.00

SPARE PARTS AND ACCESSORIES

1 Meter SAS Cable

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

3 Meter SAS Cable

1 Patch Cable SFF-8644 to SFF-8644 External JBOD 3M $75.29

SUPPORT OPTIONS

Warranty and Support

1x Return to Depot Warranty (5 Year Hardware Warranty with Standard Advance Parts Re

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2) Configuration-2:

a. Compute Server:

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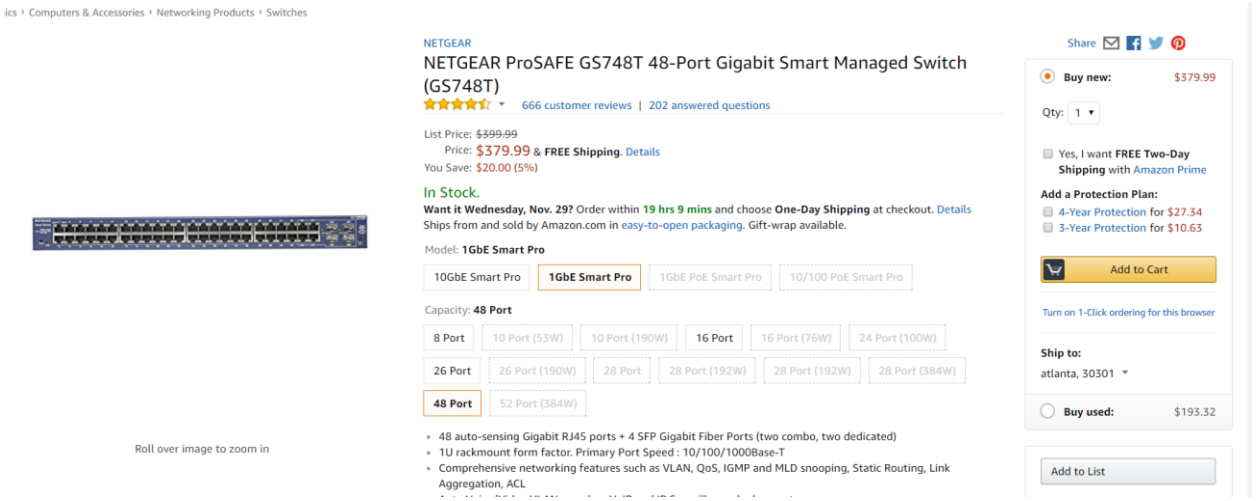
b. Network Switch:



C. Network Cable:

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Preyang Shah (pshah115@hawk.iit.edu)

d. Storage Server:

- Up to 60 HGST Ultrastar® drive modules
- 2 x SAS QSFP+ receptacles per IO Module
- Hot Swappable power supplies
- Hot Swappable SAS IO Modules
- SAS 3.0 support for operation up to 12Gbps
- Cable management arm Included
- Enclosure Services (SES-3)
- Comprehensive 5-year warranty on the entire assembly (not just the drives)

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STORAGE OPTIONS

Storage Options

1x HGST 4U 60 Bay JBOD with 60 x 12TB Helium SAS HDD (Kepler +) $0.00

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SUPPORT OPTIONS

Warranty and Support

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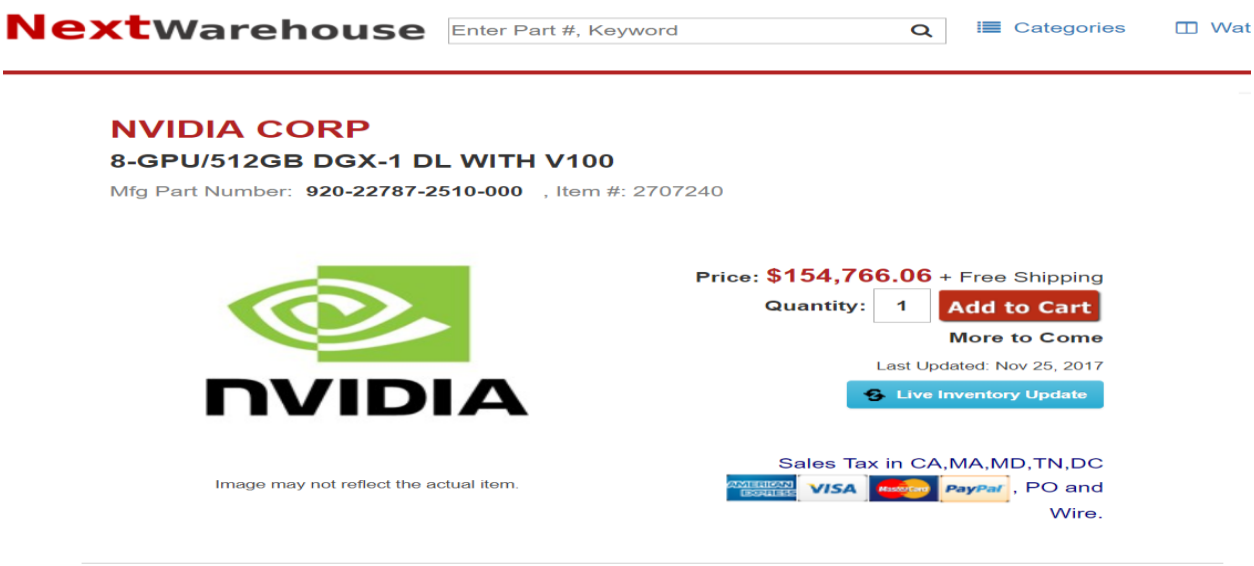
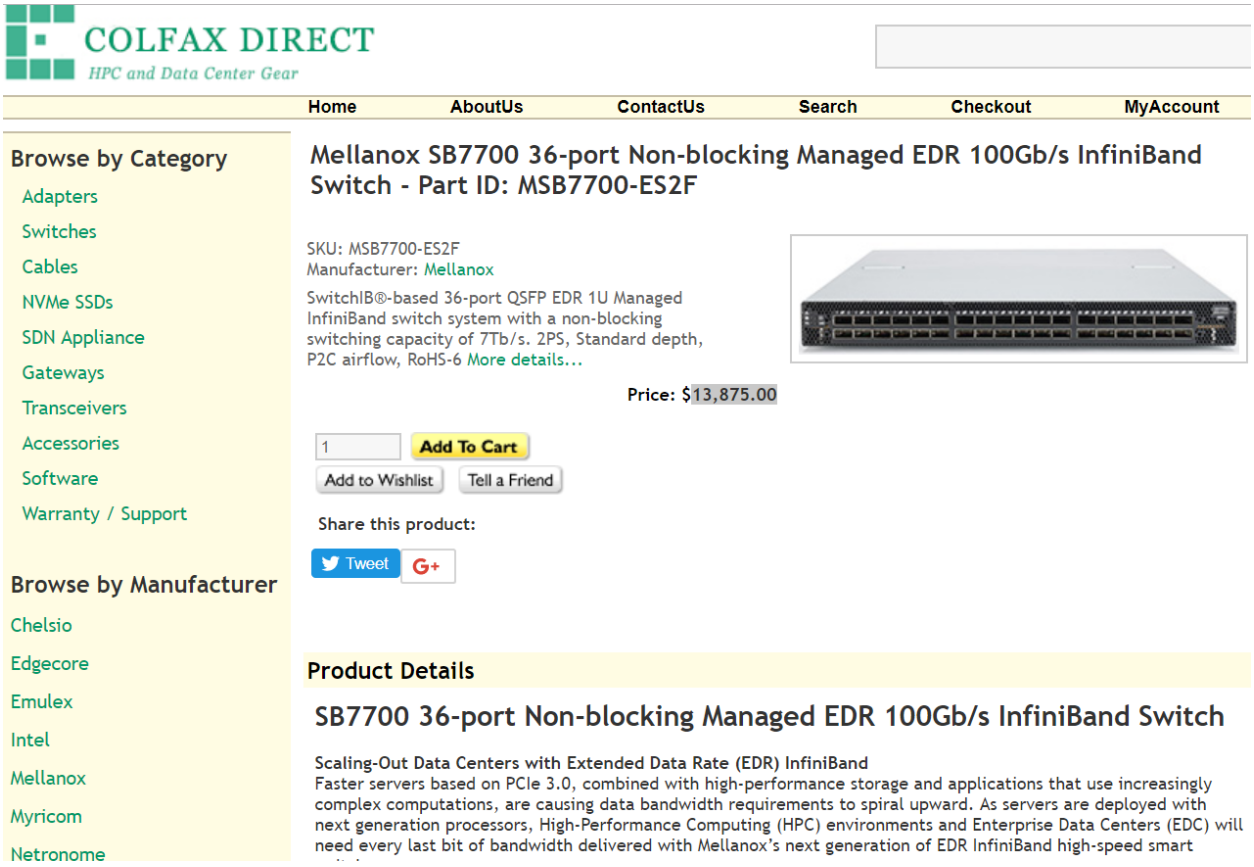
Preyang Shah (pshah115@hawk.iit.edu)

3) Configuration: -3

a. Compute Server:



b. Network Switch:



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Preyang Shah (pshah115@hawk.iit.edu)

c. Network Cable:

Mellanox MCP1600-E003 Passive Copper Cable IB EDR up to 100Gb/s QSFP LSZH 3m 26AWG

MPN: MCP1600-E003

Availability:	Ships same day
List Price:	~~$219.00~~
Our Price:	$135.00
Savings:	(You save $84.00)
Condition:	New
Technology:	InfiniBand
Speed:	EDR
Material:	Copper
Connector Type:	QSFP28
Passive/Active:	Passive
Length:	2.5m to 5m

Quantity: 1

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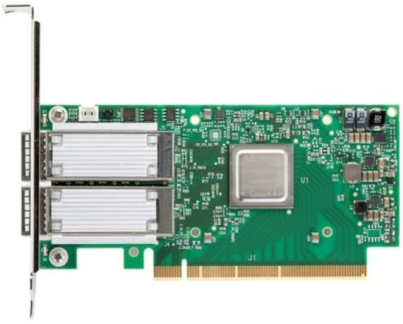
SHIPS TODAY. Order by 2pm CT*.
*Business days only.

Contact us

d. Network Card:

Mellanox MCX455A-ECAT ConnectX-4 VPI Adapter Card EDR IB (100Gb/s) and 100GbE Single-Port QSFP28 PCIe3.0 x16 ROHS R6

MPN: MCX455A-ECAT



Availability:	Ships same day
List Price:	~~$1,257.00~~
Our Price:	$765.00
Savings:	(You save $492.00)
Technology:	InfiniBand
Speed:	EDR & 100GbE
Ports:	Single
Connector Type:	QSFP28
PCI:	PCIe3.0 x16
Condition:	New
ECCN:	5A991

Quantity: 1

Add Mellanox Support?

-- None --

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Project

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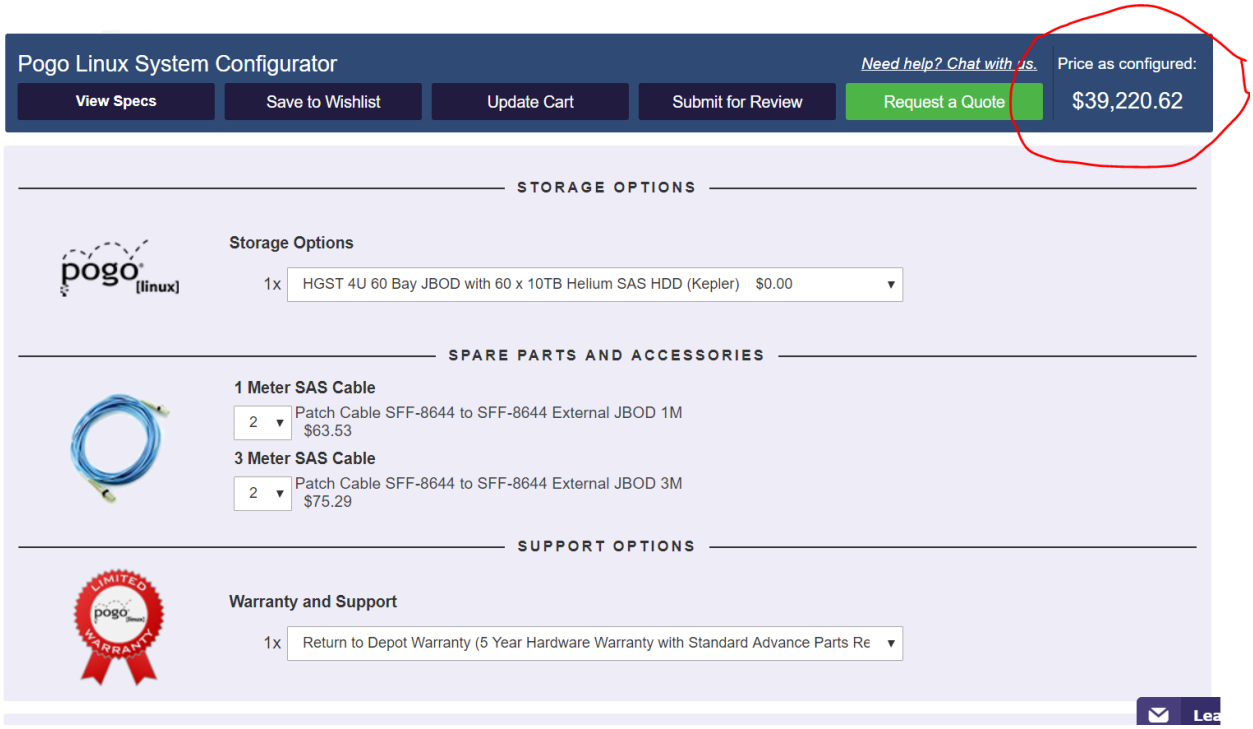
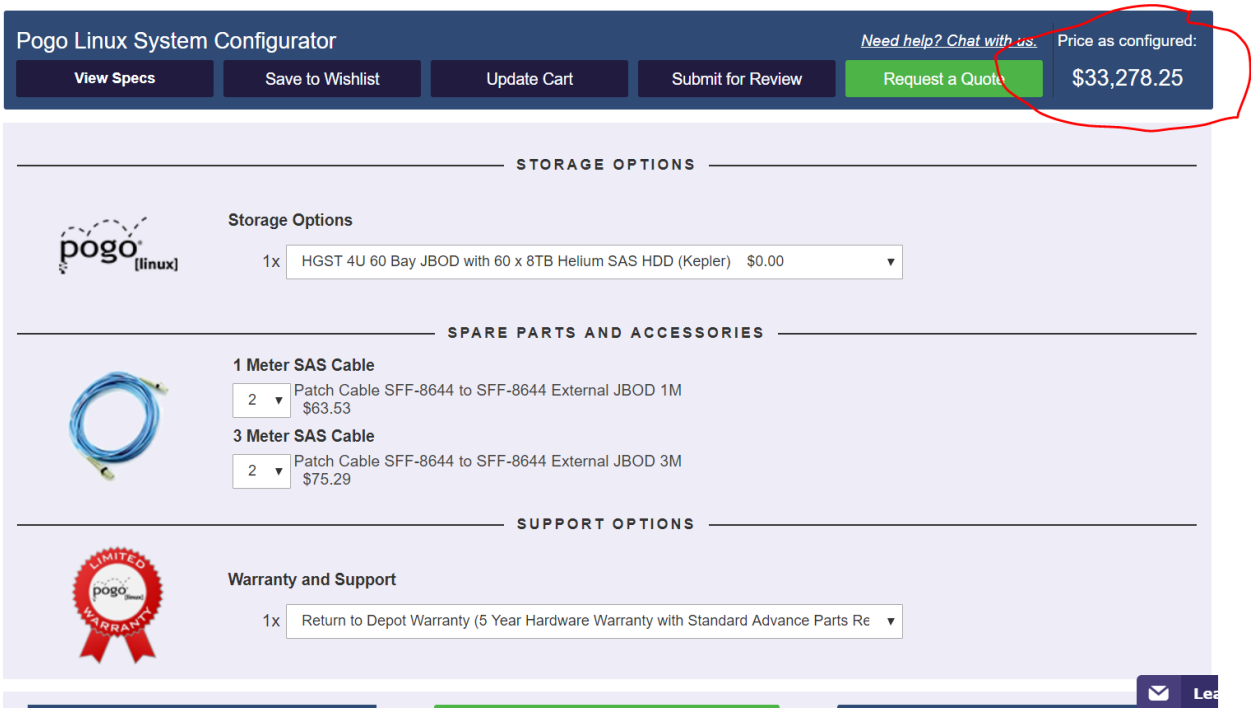
Storage Server:





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❖ Used Links for product Search:

1) Configuration:-1 :

Compute Server:- http://www.pogolinux.com/quotes/editsys?sys_id=1067451
Network Switch :- https://www.netgear.com/business/products/switches/smart/XS728T.aspx#tab-techspecs

https://www.amazon.com/NETGEAR-ProSAFE-10-Gigabit-Ethernet-XS748T-100NES/dp/B01ELW0QRO

Network Adaptor:
https://www.serversupply.com/products/part_search/pid_lookup.asp?pid=283906&gclid=EAIaIQobChMIgPu3pMLf1wIVxx2BCh1xBwZxEAQYASABEgLt5vD_BwE

Network Cable:
https://www.amazon.com/Ethernet-Cable-Vandesail-CAT7-LAN-Network-Cable-RJ45-High-Speed-Patch-Cord-STP-Gigabit-10-Gold-Plated-Lead-Patch-Panel-Black-1pack/dp/B01FU5COVC?th=1

Racks:-
https://www.rackmountsolutions.net/rackmount-solutions-cruxial-cool-42u-7kbtu-air-conditioned-server-cabinet/

Storage Server:
http://www.pogolinux.com/quotes/editsys?sys_id=1067451

2) Configuration:-2 :

Compute Server:- http://www.nixsys.com/intel-short-depth/nx236-s2hd.html

https://www.ebay.com/p/Samsung-32GB-Internal-MZMPC032HBCD-SSD/170087095

Network Switch :- https://www.amazon.com/NETGEAR-ProSAFE-48-Port-Gigabit-Managed/dp/B00I5W5M12

Network Cable:
https://www.amazon.com/Cat6-Ethernet-Patch-Cables-Networking/dp/B014EE9PIA

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3) Configuration:-3 :

Compute Server:- http://www.pogolinux.com/quotes/editsys?sys_id=1067451

Network Switch :- http://www.colfaxdirect.com/store/pc/viewPrd.asp?idproduct=2650

Network Adaptor:
https://store.mellanox.com/products/mellanox-mcx415a-ccat-connectx-4-en-network-interface-card-100gbe-single-port-qsfp28-pcie3-0-x16-rohs-r6.html?gclid=Cj0KCQiAjO_QBRC4ARIsAD2FsXM2fqd4HPO88xHEbyoeNfbfpA3PBQmExFLr6Z30gdCHl1LyFO-Eg_EaAu0xEALw_wcB

Network Cable:
https://store.mellanox.com/products/mellanox-mcp1600-e003-passive-copper-cable-ib-edr-up-to-100gb-s-qsfp-lszh-3m-26awg.html?gclid=Cj0KCQiA6enQBRDUARIsAGs1YQj_1nKds0BFFLNymZQfOBF93grFPIKT4zZSTl1Ys8bkGpnEbZKzeaAaAt94EALw_wcB

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