

# Cloud Project

Understanding the Cost of Computing in the Cloud

11/27/2017

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## Contents

Introduction: .....	3
Specifications: .....	3
Assumptions:.....	3
Configuration 1 .....	3
Configuration 2 .....	3
Configuration 3 .....	3
Configuration 1: .....	4
Public Cloud .....	4
Private Cloud.....	4
Configuration 2: .....	5
Public Cloud .....	5
Private Cloud.....	5
Configuration 3: .....	6
Public Cloud .....	6
Private Cloud.....	6
Analysis Table : .....	7
Cart for Configuration 1 Private:.....	7
8 Core:.....	7
6 core: .....	8
64 GB DDR4 RAM: .....	8
12 TB HDD: .....	8
Adaptor : .....	9
28 Port Switch: .....	9
Chassis:.....	9
Network cables: .....	10
16 Port switches:.....	10
Network cable:.....	10
42 U RACK: .....	11
600 TB Storage: .....	11
Adaptor .....	12
10 TB HDD: .....	12
Cart for Configuration 2 Private : .....	13

8 Core Processor .....	13
2 GB DDR3 RAM .....	13
1 GB RAM .....	14
4 GB RAM .....	14
8 GB RAM .....	14
32 GB HDD.....	15
Chassis:.....	15
50 Port switch .....	16
52 Port switch .....	16
48 Port Switch .....	17
Network cables .....	17
42 U RACK .....	18
600 TB Storage .....	18
Adaptor .....	19
10 TB HDD .....	19
Cart for Configuration 3 Private .....	20
GPU .....	20
Core Processor .....	20
64 GB RAM .....	21
Chassis:.....	21
36 Port Switch .....	22
16 Port Switch .....	22
Network Cable.....	22
600 TB storage .....	23
42 U RACK .....	24
Adaptor .....	24
10 TB HDD .....	25
Project Links: .....	25

# Cloud Project

## Introduction:

In this project we will calculate cost for EC2 Public cloud (d2.8xlarge, r3.large and p3.16xlarge) . On the other hand we will build a private cloud for all three configurations and compare the cost for public and private cloud .We will tabulate our analysis .

## Specifications:

Electric power cost: 4.05 cent/hr

If Ethernet speed is crossing range value of AWS then assume cost as \$0.02/month

Power consumption: 1.25 KW/hr per server.

Cooling cost per RACK for 5 years : \$7,6570.88

<https://www.vmguru.com/2011/06/how-to-calculate-electrical-costs-for-cooling-and-power-consumption/>

<http://www.rapidtables.com/calc/electric/energy-cost-calculator.htm>

<http://www.coolermaster.com/power-supply-calculator/>

## Assumptions:

Configuration 1 (Public Cloud): Ethernet speed we are getting 4PB/month. So we are assuming cost as \$0.01GB/month.

Configuration 2 (Public Cloud): From amazon we know 0.3125 PB per month as Ethernet. So we will take cost of ethernet for 350PB/month plan as \$0.05 GB/month.

Configuration 3 (Public Cloud): From amazon we are getting 1000 servers which will have 8GPU/server and ethernet speed is crossing 5PB/month plan. So will assume cost as 0.01 GB/month.

# Configuration 1:

## Public Cloud

Configuration 1											
EC2	d2.xlarge			Core		Memory		HDD		Network	Description
											Here we are getting 1050 maximum servers according to memory calculation and ethernet speed we are getting 4PB/month. So we are assuming cost as 0.02GB/month
		Cost/month		\$3,532,800		\$4,169,695.63		\$4,141,324.80		\$50,000	
		Number of instance		889		1050		1042			
S3		Network/Ethernet		Storage							
	Cost/month	\$5,184,000		\$2,100,000							
Total 5 year cost =		\$690,221,738									

## Private Cloud

Configuration 1					
Compute Servers	Quantity	Price/Unit	Price	HyperLink	Description
Cores:					
8-core	3499.00	\$892.00	\$31,331,605.00	<a href="#">Intel Xeon E5-2440 v2 Server Processor LGA1356 Eight-Core 1.9GHz 20MB 7.2GT/s 22nm 95W BX80634E52440V2 Retail</a>	We are taking 8 core and 6 core both and they should match total servers 4167
6-core	668.00	\$671.09	\$1,107,029.64	<a href="#">Intel Xeon E5-1650 v4 Processor LGA2011-3 Broadwell 15MB 3.60 GHz 6 Core/12 Thread BX80660E51650V4 Box</a>	
Memory	4167.00	\$899.99	\$448,288.12	<a href="#">64GB PC4-21300 DDR4-2666Mhz Load Reduced ECC Quad Ranked 1.2V Major Brand</a>	We are taking 64 GB RAM
HDD	4167.00	\$663.99	\$2,766,846.33	<a href="#">12TB Western Digital WD121KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk</a>	We are taking 12 TB HDD
Chasis	4167.00	\$62.42	\$260,104.14	<a href="#">Cooler Master N400 NSE-400-KKN2 N-Series Mid Tower Computer Case with ATX Motherboard Support, Multiple 240mm Radiator Support, and Ventilated Front Panel</a>	
Network Switches					
28 Port Switch	349.00	\$2,248.99	\$784,897.51	<a href="#">NETGEAR ProSAFE XS728T 28-Port 10-Gigabit Ethernet Smart Managed Switch (XS728T) - Lifetime Warranty</a>	We have calculated switches and cables using 28 port switch
Network Cables	252448.00	\$49.99/10m	\$12,619,875.52	<a href="#">7m (23ft) Extreme Networks 10GB-C07-SFP+ Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable</a>	
Distributed Storage:					
Network Switches :					
16 Port Switch	12.00	\$10,231.50	\$122,778.00	<a href="#">Spectrum Based 100Gb 1U Open Ethernet Switch With Mlnx-Os, 16 Qsfp28 Ports, 2 P</a>	For distributed storage we are using 16 port switch
Network Cables	169.00	\$467.00	\$78,923.00	<a href="#">Mellanox MCP7H00-G02A Passive Copper Hybrid Cable Ethernet 100Gb/s to 2x50Gb/s QSFP28 to 2xQSFP28 2.5m 30AWG</a>	
Racks					
42 Unit	382.00	\$929.99	\$355,256.18	<a href="#">Tripp Lite SR42UB 42U Rack Enclosure Server Cabinet Doors and Sides 3000lb Capacity</a>	We are using 42 U rack and placing compute servers and distributed servers in that
Storage Servers					
Adaptor	167.00	\$1,399.99	\$233,798.33	<a href="#">HPE StoreFabric SN1200E 16 Gb dual port Fibre Channel Host Bus Adapter</a>	
J4601S - HGST 4U 60 Bay JBOD with 60 x 10TB Helium SAS HDD:	167.00	\$39,006.51	\$6,514,087.17	<a href="http://www.pogolinux.com/products/storage-rackmount-servers">http://www.pogolinux.com/products/storage-rackmount-servers</a>	
HDD	10020.00	\$483.99	\$4,849,579.80	<a href="#">10TB Western Digital WD101KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk</a>	
Electric Power (For 5 years)					we are taking kw/hr cost as 4.05 cent/hr
Cooling (For 5 years)	382.00	\$76,570.88	29250076.16		Total power consumption per rack for 5 year according to BTU calculation
Administration (For 5 years)	5.00	\$71,144.00	\$1,778,600.00	<a href="#">Systems Administrator Salaries</a>	system admin cost who can maintain 1000 servers
Total		\$75,369,179.64			

## Configuration 2:

### Public Cloud

Configuration 2							
EC2	r3.large		Core	Memory	SSD	Network	Description
		Cost/Month	\$119,520,000	\$119,520,000	\$119,520,000	\$15,625	Here we are getting 1000000 servers and 0.3125 PB per month as Ethernet. So we will take cost of ethernet for 350PB/month plan as 0.05 GB/month
		Number of instance	1000000	1000000	1000000		
S3		Network/Ethernet	Storage				
		\$518,400	\$210,000				
Total 5 year cost =		\$7,215,841,500					

### Private Cloud

Configuration 2					
Compute Servers (For each VM)	Quantity	Price/Unit	Price	HeperLink	Description
Cores:					
8-core	1.00	\$1,306.60	\$1,306.60	<a href="#">Intel Xeon E7-4809 v3 Processor LGA2011 20M Cache 2.0 GHz 8 Core/ 16 Thread CM8064501551526 TRAY</a>	We are taking 8 core processor and total quantity is 125000
Memory:					
2GB	8.00	\$35.99	\$287.92	<a href="#">2GB DDR3 PC3-10600 240-pin DIMM DDR3-1333 Registered ECC 1.5V Brand Name</a>	We are taking 2 GB RAM for 1 core, So for 8 core it will be multiplied by 8.
1GB	8.00	\$23.99	\$191.92	<a href="#">1GB DDR3 PC3-10600 240-pin DIMM DDR3-1333 Unbuffered Non-ECC 1.5V Brand Names</a>	We are taking 1 GB RAM for 1 core, So for 8 core it will be multiplied by 8.
4GB	8.00	\$45.99	\$367.92	<a href="#">4GB DDR3 PC3-14900 240-pin DIMM DDR3-1866 Unbuffered Non-ECC 1.35V Brand Names</a>	We are taking 4 GB RAM for 1 core, So for 8 core it will be multiplied by 8.
8GB	8.00	\$119.99	\$959.92	<a href="#">8GB DDR3 PC3-14900 240-pin DIMM DDR3-1866 Un-Buffered ECC 1.5V major Brand</a>	We are taking 8 GB RAM for 1 core, So for 8 core it will be multiplied by 8.
HDD	8.00	\$91.99	\$735.92	<a href="#">Intel 32GB MEMPEK1W032GA Optane Memory Series NVMe PCIe M.2 2280 1350MB/sec Read 20nm 3D Xpoint</a>	We are taking 32 GB HDD for 1 core, So for 8 core it will be multiplied by 8.
Chasis	125000.00	\$62.42	\$7,802,500.00	<a href="#">Cooler Master N400 NSE-400-KKN2 N-Series Mid Tower Computer Case with ATX Motherboard Support, Multiple 240mm Radiator Support, and Ventilated Front Panel</a>	
Compute Servers (For 1 million VM)	125000.00	\$3,850.20	\$481,275,000.00		Total Quantity is 1minllion ( servers)
Network Switches					
52 Port Switch	1.00	\$1,625.85	\$1,625.85	<a href="#">NETGEAR ProSAFE 52-Port PoE Gigabit Stackable Smart Managed Switch (GS752TXP) - Lifetime Warranty</a>	We are taking 52 port and 50 port switches
50 Port Switch	2550.00	\$1,120.99	\$2,858,524.50	<a href="#">Cisco SG300-52P 50-Port 10/100/1000 Gigabit Managed PoE+ Switch</a>	
48 Port Switch	1.00	\$3,999.99	\$3,999.99	<a href="#">NETGEAR ProSAFE XS748T 48-Port 10-Gigabit Ethernet Smart Managed Switch</a>	We are taking 48 port switch for distributed storage
Network Cables	122569.00	\$12.8/5meter	\$1,568,883.20	<a href="#">1ft Cat6 Blue Ethernet Patch Cable, Snagless/Molded Boot</a>	
Racks					
42 Unit	12517.00	\$929.99	\$11,640,684.83	<a href="#">Tripp Lite SR42UB 42U Rack Enclosure Server Cabinet Doors and Sides 3000lb Capacity</a>	42 U rack we are taking, and putting 10 servers.
Storage Servers :					
Adaptor J4601S - HGST 4U 60 Bay JBOD with 60 x 10TB Helium SAS HDD:	17.00	\$1,399.99	\$23,799.83		
	17.00	\$39,006.51	\$663,110.67	<a href="http://www.pogolinux.com/products/storage-rackmount-servers">http://www.pogolinux.com/products/storage-rackmount-servers</a>	
HDD(for 1 Storage server):	1020.00	\$483.99	\$493,669.80	<a href="#">10TB Western Digital WD101KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk</a>	
Electric Power (5 years)		\$36,081,569.50	\$36,081,569.50	<a href="https://www.electricitylocal.com/states/illinois/chicago/">https://www.electricitylocal.com/states/illinois/chicago/</a>	we are taking kw/hr cost as 4.05 cent/hr
Cooling (For 5 years)	12517.00	76570.879	\$958,437,692.40		Total power consumption per rack for 5 year accoding to BTU calculation
Administration (For 5 years)	1251.00	\$71,144.00	\$89,001,144.00	<a href="#">Systems Administrator Salaries</a>	system admin cost who can maintain 1000 servers
Total		\$1,589,856,054.77			

## Configuration 3:

### Public Cloud

Configuration 3											
EC2	p3.16xlarge		GPU	Memory	Network					Description	
		Cost/Month	\$17,625,600	\$17,625,600	\$1,562,500					Here we are getting 1000 servers which will have 8GPU/server , each GPU has 125 teraflop mixed precision and ethernet speed is crossing 5PB/month plan. So will assume cost as 0.02 GB/month	
		Number of instance	1000 (8-GPU Servers)	1000 (8-GPU Servers)							
S3		Network/Ethernet	Storage								
		\$518,400	\$21,000								
Total 5 year cost =	\$1,183,650,000										

### Private Cloud

Configuration 3					
Compute Servers	Quantity	Price/Unit	Price	Description	We are taking 1000 GPU machine and each GPU has 125 teraflop mixed precision
	1000.00	\$154,766.06	\$154,766,060.00	<a href="#">NVIDIA CORP 8-GPU/512GB DGX-1 DL WITH V100</a>	
				<a href="#">Intel Xeon Phi™ Processor 7230 LGA3647 32 MB L2 Cache 16GB 1.30 GHz 64 Core HJ8066702859400 TRAY</a>	64 core machine we require , and total servers will be 1000 , so 64000 cores
	64 core	1000.00	\$2,280.00	\$2,280,000.00	
	Memory			<a href="#">64GB PC4-21300 DDR4-2666Mhz Load Reduced ECC Quad Ranked 1.2V Major Brand</a>	we are taking 64 GB RAM
64GB	8000.00	\$899.99	\$7,199,920.00	<a href="#">Cooler Master N400 NSE-400-KKN2 N-Series Mid Tower Computer Case with ATX Motherboard Support, Multiple 240mm Radiator Support, and Ventilated Front Panel</a>	
Chasis	1000.00	\$62.42	\$62,420.00		
Network Switches				<a href="#">Mellanox MSB7890-ES2R Switch-IB 2 Based EDR InfiniBand 1U Switch 36 QSFP28 Ports 2 Power Supplies (AC) Unmanaged Standard Depth C2P Airflow Rail Kit RoHS6</a>	36 port and 16 port we are taking for fat treet network
36 Port Switch	35.00	\$13,005.00	\$455,175.00		
16 Port Switch	1.00	\$1,299.99	\$1,299.99	<a href="#">NETGEAR ProSAFE XS716T 16-Port 10-Gigabit Ethernet Smart Managed Switch</a>	
				<a href="#">10m (33ft) Cisco QSFP-100G-AOC10M Compatible 100G QSFP28 Active Optical Cable</a>	
Network Cables	1059.00	\$510.00	\$540,090.00		42 u rack we are taking
Racks				<a href="#">Tripp Lite SR42UB 42U Rack Enclosure Server Cabinet Doors and Sides 3000lb Capacity</a>	
42 Unit	101.00	\$929.99	\$93,928.99		
Storage Servers					
Adaptor	2.00	\$1,399.99	\$2,799.99		
J4601S - HGST 4U 60 Bay JBOD with 60 x 10TB Helium SAS HDD:	2.00	\$39,006.51	\$78,013.02	<a href="http://www.pogolinux.com/products/storage-rackmount-servers">http://www.pogolinux.com/products/storage-rackmount-servers</a>	
HDD	120.00	\$483.99	\$58,078.80	<a href="#">10TB Western Digital WD101KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk</a>	we are taking kw/hr cost as 4.05 cent/hr
Electric Power (5 years)		\$1,777,425.48		<a href="https://www.electricitylocal.com/states/illinois/chicago/">https://www.electricitylocal.com/states/illinois/chicago/</a>	Total power consumption per rack for 5 year according to BTU calculation
Cooling (For 5 years)	103.00	\$76,570.88	\$7,886,800.64		system admin cost who can maintain 1000 servers
Administration (For 5 years)	1.00	\$71,144.00	\$355,720.00	<a href="#">Systems Administrator Salaries</a>	
Total		\$173,780,306.43			

## Analysis Table :

	Configuration 1	Configuration 2	Configuration 3
Public Cloud (including EC2 and S3) Cost over 5 years, 24/7 operation, with 100% usage	\$690,221,738	\$7,215,841,500	\$1,183,650,000
Private Cloud cost over 5 years, 24/7 operation, with 100% usage	\$75,369,179.64	\$1,589,856,054.77	\$173,780,306.43
What utilization must be achieved with the private cloud to make the private cloud option more attractive than the public cloud?	If we are taking 100% utilization for both then Public cloud is 9.15 times costlier than Private cloud , so We can go with private cloud , so it is better to build private cloud then renting public cloud	If we are taking 100% utilization for both then Public cloud is 4.53 times costlier than Private cloud , so We can go with private cloud, so it is better to build private cloud then renting public cloud	If we are taking 100% utilization for both then Public cloud is 6.81 times costlier than Private cloud , so We can go with private cloud, so it is better to build private cloud then renting public cloud

## Cart for Configuration 1 Private:

8 Core:


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### Intel Xeon E5-2440 v2 Server Processor LGA1356 Eight-Core 1.9GHz 20MB 7.2GT/s 22nm 95W BX80634E52440V2 Retail

Product Code: CP-IT-XE52440V2  
Manufacturer: Intel  
Special Order(Non-Refundable)

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6 core:



**Intel Xeon E5-1650 v4 Processor LGA2011-3  
Broadwell 15MB 3.60 GHz 6 Core/12 Thread  
BX80660E51650V4 Box**

Product Code: CP-IT-XE51650V4BOX

List Price: \$671.09  
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64 GB DDR4 RAM:

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**64GB PC4-21300 DDR4-2666Mhz Load Reduced  
ECC Quad Ranked 1.2V Major Brand**

Product Code: DR4-64G-LR21300E

Manufacturer: Crucial

Special Order(Non-Refundable) **Preorder**

**Your Price: \$899.99 / Each**

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12 TB HDD:

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**12TB Western Digital WD121KRYZ - WD Gold  
Datacenter Hard Drive SATA 6.0 GB/s 7200rpm  
256MB 3.5-inch Bulk**

Product Code: HD-WD-121KRYZ

Manufacturer: Western Digital

**Your Price: \$663.99 / Each**

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## Network cables:

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### 7m (23ft) Extreme Networks 10GB-C07-SFPP Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable #40164



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FS P/N: SFP-10G-DAC

MFG PART#: 10GB-C07-SFPP

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MPN: MCP7F00-A002



Availability: **Ships same day**

List Price: \$203.00

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Condition: New

Technology: Ethernet

Speed: 100GbE

Material: Copper

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Passive/Active: QSFP28 to 4xSFP28

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Tripp Lite

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##### Storage Options

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#### SPARE PARTS AND ACCESSORIES



##### 1 Meter SAS Cable

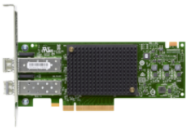
Patch Cable SFF-8644 to SFF-8644 External JBOD 1M \$63.53

##### 3 Meter SAS Cable

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

Adaptor

Home / Storage / Storage Networking / Host Bus Adapters / HPE StoreFabric SN1200E 16Gb Fibre Channel Host Bus Adaptor



HPE StoreFabric SN1200E 16 Gb dual port Fibre Channel Host Bus Adaptor

PRODUCT : Q0L14A			
Partner	Availability	Price (USD)	Lease Option
<input checked="" type="radio"/> PCM ⓘ	<input checked="" type="checkbox"/> In Stock	\$1,399.99	from \$42.49/mo*
<input type="radio"/> Insight ⓘ	<input checked="" type="checkbox"/> In Stock	\$1,479.99	-

Key Features

Port speed: 16 Gb/s Fibre Channel  
Channels: Dual

10 TB HDD:

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10TB Western Digital WD101KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk

Product Code: HD-WD-101KRYZ  
Manufacturer: Western Digital

Your Price: \$483.99 / Each

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## Cart for Configuration 2 Private :

### 8 Core Processor



#### Intel Xeon E7-4809 v3 Processor LGA2011 20M Cache 2.0 GHz 8 Core/ 16 Thread CM8064501551526 TRAY

Product Code: CP-IT-XE74809V3TRAY

Manufacturer: Intel

Special Order(Non-Refundable) [Preorder](#)

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### 2 GB DDR3 RAM

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#### 2GB DDR3 PC3-10600 240-pin DIMM DDR3-1333 Registered ECC 1.5V Brand Name

Product Code: DR3-2G-R10600E

Manufacturer: Kingston

**Your Price: \$35.99 / Each**

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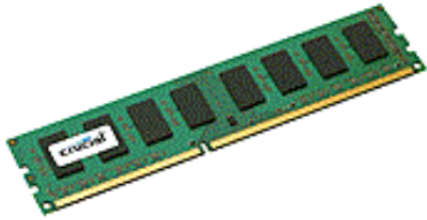
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## 1 GB RAM

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### 1GB DDR3 PC3-10600 240-pin DIMM DDR3-1333 Unbuffered Non-ECC 1.5V Brand Names

Product Code: DR3-1G-10600

Manufacturer: Qimonda

**Your Price: \$23.99 / Each**

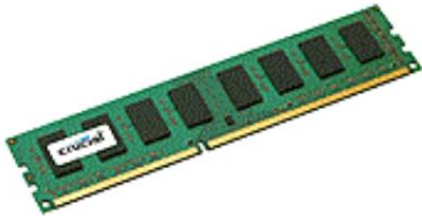
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## 4 GB RAM

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### 4GB DDR3 PC3-14900 240-pin DIMM DDR3-1866 Unbuffered Non-ECC 1.35V Brand Names

Product Code: DR3-4G-14900

Manufacturer: Crucial

**Your Price: \$45.99 / Each**

★★★★★ 0 Review(s)

1 ▼

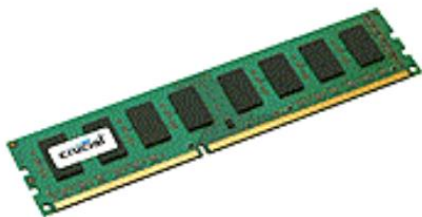
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## 8 GB RAM

[Home](#) > [Products](#) > [Memory](#)



### 8GB DDR3 PC3-14900 240-pin DIMM DDR3-1866 Un-Buffered ECC 1.5V major Brand

Product Code: DR3-8G-14900E

Manufacturer: Crucial

**Your Price: \$119.99 / Each**

★★★★★ 0 Review(s)

1 ▼

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## 32 GB HDD

[Home](#) > [Products](#) > [Hard Drive | SSD | SATADOM](#)



### Intel 32GB MEMPEK1W032GA Optane Memory Series NVMe PCIe M.2 2280 1350MB/sec Read 20nm 3D Xpoint

Product Code: SSD-IT-MEMPEK1W032GA

Manufacturer: Intel

Preorder

Your Price: \$91.99 /

★★★★★ 0 Review(s)

1

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Features

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## Chassis:



### Cooler Master N400 NSE-400-KKN2 N-Series Mid Tower Computer Case with ATX Motherboard Support, Multiple 240mm Radiator Support, and Ventilated Front Panel

★★★★★ (74) Write a Review See 16 Questions | 84 Answers

SHARE

In stock. Ships from United States. Most customers receive within 3-10 days.

Sold and Shipped by [BuyVPC.com](#)

Type: ATX Mid Tower

ATX Mid Tower

MicroATX Mini Tower

MicorATX Mini Tower w/ Solid Front Panel

- Polymer, mesh front bezel ATX Mid Tower
- USB 3.0 x 2 (int.), USB 2.0 x 2, Mic x 1, Audio x 1 (supports AC97 / HD Audio) Front Ports
- 2 External 5.25" Drive Bays
- 7 Internal 3.5" Drive Bays

★ FREE SHIPPING AVAILABLE

\$62.<sup>42</sup>

Sold and Shipped by:

[BuyVPC.com](#)

★★★★★ (3,060)

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\$59.99



## 50 Port switch

### Cisco SG300-52P 50-Port 10/100/1000 Gigabit Managed PoE+ Switch

B&H # CISG30052PK9 • MFR # SG300-52P-K9-NA



#### In Stock

Order **now** to ship **tomorrow**

**Free Expedited Shipping**

#### PRODUCT HIGHLIGHTS

- 50 x 10/100/1000 Ports
- 48 x PoE+ Ports with 375 W Power Budget
- 2 x Combo mini-GBIC Ports
- QoS Support

Show more

★★★★★ Review 1 | Q&A 0

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\$0.00 Tax Collected Outside NY and NJ ⓘ

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1 QTY

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Q&A 0

ACCESSORIES

## 52 Port switch

NETGEAR

### NETGEAR ProSAFE 52-Port PoE Gigabit Stackable Smart Managed Switch (GS752TXP) - Lifetime Warranty

Be the first to review this product... Ask Or Answer A Question

SHARE

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- 48 PoE+-capable Gigabit copper ports
- 2 dedicated 10G SFP+ Fiber ports
- 2 dedicated 10GBase-T Copper ports
- 4 dedicated 10G ports
- Lifetime Warranty, Next Business Day Replacement, 24 / 7 Tech Support

★ **FREE SHIPPING AVAILABLE** ⓘ

**\$1,625<sup>85</sup>**

18 months special financing ⓘ

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ⓘ This product is available at a lower price from other sellers

## 48 Port Switch



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TRENDING NOW: cyber monday 2017 cyber monday laptop msi rx 580

**newegg Business** 

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Keywords, Model # or Item #

Home > Networking > Wired Networking > Switches > Netgear Inc. > Item#: N82E16833122845



**NETGEAR**  
**NETGEAR ProSAFE XS748T 48-Port 10-Gigabit Ethernet Smart Managed Switch**  
Be the first to review this product... Ask Or Answer A Question

In stock. Ships from United States.  
Sold and Shipped by Newegg

Primary Port: 48 Port

8 Port

16 Port

28 Port

48 Port

- Advanced VLAN features such as protocol-based VLAN, MAC-based (Media Access Control) VLAN and 802.1x Guest VLAN

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**\$3,999<sup>99</sup>**

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## Network cables



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Keywords, Model # or Item #

Home > Networking > Wired Networking > Cables > Cat6 Ethernet Cables > Item#: N82E16833122845



**FREE SHIPPING**  
**On Orders Over \$50**  
Restrictions apply - Click for details 

**1ft Cat6 Blue Ethernet Patch Cable, Snagless/Molded Boot**

**Product Details**

Part #:

10X8-06101

Warranty:

[Lifetime](#)

UPC Number:

846568011498

End 1:

Cat6 Male Plug

End 2:

Cat6 Male Plug

Length:

1 foot

Color:

Blue

Wire Gauge:

24 AWG

Shield Type:

unshielded

**Helpful Downloads**

[PDF Spec Sheet](#) 

4.8 ★★★★★

## 42 U RACK



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Tripp Lite

### Tripp Lite SR42UB 42U Rack Enclosure Server Cabinet Doors and Sides 3000lb Capacity

★★★★☆ 25 customer reviews | 9 answered questions

Was: ~~\$1,102.39~~

Price: **\$929.99**

You Save: **\$172.40 (16%)**

*i* Item is eligible: **No interest if paid in full within 12 months** with the Amazon.com Store Card. [Apply now](#)

**Only 11 left in stock - order soon.**

Ships from and sold by Amazon.com exclusively for Prime members. [Details](#)

Style: **Standard**

2000lb Capacity

2400lb Capacity

Co-location

Deep

Glass Door

NEMA

No Sides

No Sides/Doors

Shallow

**Standard**

Unassembled

White

- SmartRack enclosures are designed for secure, high density server and networking applications in IT environments.

## 600 TB Storage



- Up to 60 HGST Ultrastar® drive modules
- 2 x SAS QSF+ 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**

### Pogo Linux System Configurator

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**\$39,006.51**

#### STORAGE OPTIONS



##### Storage Options

1x HGST 4U 60 Bay JBOD with 60 x 10TB Helium SAS HDD (Kepler) \$0.00

#### SPARE PARTS AND ACCESSORIES



##### 1 Meter SAS Cable

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

##### 3 Meter SAS Cable

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

# Adaptor

Home / Storage / Storage Networking / Host Bus Adapters / HPE StoreFabric SN1200E 16Gb Fibre Channel Host Bus Adapter



## HPE StoreFabric SN1200E 16 Gb dual port Fibre Channel Host Bus Adapter

PRODUCT : Q0L14A

Partner	Availability	Price (USD)	Lease Option
<input checked="" type="radio"/> PCM ⓘ	<span style="color: green;">■</span> In Stock	<del>\$1,399.99</del>	from \$42.49/mo*
<input type="radio"/> Insight ⓘ	<span style="color: green;">■</span> In Stock	\$1,479.99	-

### Key Features

Port speed: 16 Gb/s Fibre Channel  
Channels: Dual

# 10 TB HDD

Home > Products > Hard Drive | SSD | SATADOM



## 10TB Western Digital WD101KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk

Product Code: HD-WD-101KRYZ  
Manufacturer: Western Digital

Your Price: \$483.99 / Each

★★★★★ 0 Review(s)

1

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### GPU

**NVIDIA CORP**

**8-GPU/512GB DGX-1 DL WITH V100**

Mfg Part Number: **920-22787-2510-000** , Item #: 2707240



Price: **\$154,766.06** + Free Shipping

Quantity:  **Add to Cart**

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### Core Processor

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Home > Products > CPUs



**Intel Xeon Phi™ Processor 7230 LGA3647 32 MB L2 Cache 16GB 1.30 GHz 64 Core HJ8066702859400 TRAY**

Product Code: CP-IT-X7230TRAY  
Manufacturer: Intel  
Special Order(Non-Refundable) **Preorder**

List Price: \$4,041 / Each  
**Your Price: \$2,280 / Each**

★★★★★ 0 Review(s)

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64 GB RAM

Home > Products > Memory



64GB PC4-21300 DDR4-2666Mhz Load Reduced ECC Quad Ranked 1.2V Major Brand

Product Code: DR4-64G-LR21300E  
Manufacturer: Crucial  
Special Order(Non-Refundable) Preorder

Your Price: \$899.99 / Each

★★★★★ 0 Review(s)

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Chassis:



Cooler Master N400 NSE-400-KKN2 N-Series Mid Tower Computer Case with ATX Motherboard Support, Multiple 240mm Radiator Support, and Ventilated Front Panel

★★★★★ (74) [Write a Review](#) [See 16 Questions | 84 Answers](#) [SHARE](#)

In stock. Ships from United States. Most customers receive within 3-10 days.  
Sold and Shipped by [BuyVPC.com](#)

- Type: ATX Mid Tower
- ATX Mid Tower   MicroATX Mini Tower
- MicorATX Mini Tower w/ Solid Front Panel

- Polymer, mesh front bezel ATX Mid Tower
- USB 3.0 x 2 (int.), USB 2.0 x 2, Mic x 1, Audio x 1 (supports AC97 / HD Audio) Front Ports
- 2 External 5.25" Drive Bays
- 7 Internal 3.5" Drive Bays

★ FREE SHIPPING AVAILABLE

\$62.42

Sold and Shipped by:  
BuyVPC.com (3,060)

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Best Service Sellers

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\$63.56  
+ FREE SHIPPING AVAILABLE

Newegg VIEW DETAILS  
\$59.99



## 36 Port Switch

Mellanox MSB7890-ES2R Switch-IB 2 Based EDR InfiniBand 1U Switch 36 QSFP28 Ports 2 Power Supplies (AC) Unmanaged Standard Depth C2P Airflow Rail Kit RoHS6

Condition: New

MPN: MSB7890-ES2R



Availability: [Click for Lead Time](#)

List Price: \$21,328.00

Our Price: **\$13,005.00**

Savings: (You save \$8,323.00)

Switch Family: SB7800

Condition: New

Ports: 36

Connector Type: QSFP28

Speed: EDR

Technology: InfiniBand

ECCN: 5A991

Quantity: 1

Add to Cart

Get a Quote?

FREE SHIPPING. Orders over \$499.

## 16 Port Switch

NETGEAR

### NETGEAR ProSAFE XS716T 16-Port 10-Gigabit Ethernet Smart Managed Switch

Be the first to review this product... [Ask Or Answer A Question](#)

SHARE

In stock. Ships from United States.

Sold and Shipped by Newegg

Primary Port: 16 Port

8 Port

16 Port

28 Port

48 Port

- Advanced VLAN features such as protocol-based VLAN, MAC-based (Media Access Control) VLAN and 802.1x Guest VLAN
- Advanced QoS (Quality of Service) with L2 / L3 / L4 awareness and 8 priority queues
- 5

★ FREE SHIPPING AVAILABLE

\$1,299.99

18 months special financing

PREMIER - FREE 3 DAY or faster shipping

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3 Year Network Protection Plan \$199.99

4 Year Network Protection Plan \$264.99

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Home > Fiber Optic Transceivers > Active Optical Cables > 100G QSFP28 to QSFP28 AOC > Cisco QSFP28 to QSFP28 AOC

### 10m (33ft) Cisco QSFP-100G-AOC10M Compatible 100G QSFP28 Active Optical Cable #50179



Every cable is individually tested on a full range of Cisco equipment and passed the monitoring of Fiberstore's intelligent quality control system.

★★★★★

FS P/N:

QSFP28-100G-AOC

MFG PART#:

QSFP-100G-AOC10M

Length:

1m

2m

3m

5m

7m

10m

15m

20m

25m

30m

4.8 ★★★★★  
Google

600 TB storage



- 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

Pogo Linux System Configurator

[Need help? Chat with us.](#)

Price as configured:

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Save to Wishlist


Add to Cart

Submit for Review

Request a Quote

\$39,006.51


STORAGE OPTIONS



Storage Options

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SPARE PARTS AND ACCESSORIES



1 Meter SAS Cable

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

3 Meter SAS Cable

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



42 U RACK



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isions-Video/b/ref=sv\_e\_2?ie=UTF8&node=1266092011



Shop now »

Tripp Lite

# Tripp Lite SR42UB 42U Rack Enclosure Server Cabinet Doors and Sides 3000lb Capacity

★★★★☆ 25 customer reviews | 9 answered questions

Was: ~~\$1,102.39~~

Price: **\$929.99**

You Save: **\$172.40 (16%)**

*i* Item is eligible: **No interest if paid in full within 12 months** with the Amazon.com Store Card. [Apply now](#)

**Only 11 left in stock - order soon.**

Ships from and sold by Amazon.com **exclusively for Prime members.** [Details](#)

Style: **Standard**

2000lb Capacity

2400lb Capacity

Co-location

Deep

Glass Door

NEMA

No Sides

No Sides/Doors

Shallow

**Standard**

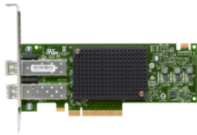
Unassembled

White

- SmartRack enclosures are designed for secure, high density server and networking applications in IT environments.

Adaptor

Home / Storage / Storage Networking / Host Bus Adapters / HPE StoreFabric SN1200E 16Gb Fibre Channel Host Bus Adapter



## HPE StoreFabric SN1200E 16 Gb dual port Fibre Channel Host Bus Adapter

PRODUCT : Q0L14A

Partner	Availability	Price (USD)	Lease Option
<input checked="" type="radio"/> PCM <i>i</i>	<span style="color: green;">■</span> In Stock	<b>\$1,399.99</b>	from <i>\$42.49/mo*</i>
<input type="radio"/> Insight <i>i</i>	<span style="color: green;">■</span> In Stock	\$1,479.99	-

### Key Features

**Port speed:** 16 Gb/s Fibre Channel  
**Channels:** Dual

## 10 TB HDD

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### 10TB Western Digital WD101KRYZ - WD Gold Datacenter Hard Drive SATA 6.0 GB/s 7200rpm 256MB 3.5-inch Bulk

Product Code: HD-WD-101KRYZ

Manufacturer: Western Digital

**Your Price: \$483.99 / Each**

★★★★★ 0 Review(s)

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## Project Links:

<https://www.networkworld.com/article/2166356/cloud-computing/how-to-build-a-private-cloud.html>

<https://www.stratoscale.com/resources/whitepaper/building-a-private-cloud-step-by-step/>

<https://www.quora.com/What-are-the-specs-of-a-typical-modern-server>

<https://www.cs.cornell.edu/courses/cs5413/2014fa/lectures/08-fattree.pdf>

<http://searchdatacenter.techtarget.com/tip/Calculating-costs-of-data-center-cabling-infrastructure>

[https://www.cisco.com/c/en/us/solutions/collateral/data-center-virtualization/unified-computing/white\\_paper\\_c11-680202.pdf](https://www.cisco.com/c/en/us/solutions/collateral/data-center-virtualization/unified-computing/white_paper_c11-680202.pdf)

<http://clusterdesign.org/fat-trees/>

[https://en.wikipedia.org/wiki/Thermal\\_design\\_power](https://en.wikipedia.org/wiki/Thermal_design_power)

<https://www.electricitylocal.com/states/illinois/chicago/>

<https://www.ec2instances.info/?selected=p3.16xlarge>

<https://aws.amazon.com/ec2/instance-types/p3/>

<https://www.nvidia.com/en-us/data-center/tesla-v100/>

<http://www.ecmag.com/section/miscellaneous/copper-cabling-really-cheaper-fiber-optic-cabling> --> cable cost

<http://www.nvidia.com/object/accelerate-inference.html>

<https://www.thinkmate.com/order>

<http://www.mellanox.com/>

<http://www.rapidtables.com/calc/electric/energy-cost-calculator.htm>

<http://www.coolermaster.com/power-supply-calculator/>