

Cost of Computing in the Cloud

Rohit Lakde

Configuration 1: Hadoop/Spark Cluster with 128K-cores, 1PB memory, 200PB 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 400PB distributed storage shared across the entire cloud should be procured, with enough capacity for 400GB/sec throughput (for pricing comparison, see S3)

Ans:

Private Cloud:

Type	Description	Price per Item	Quantity	Total Price(5Yrs)
Computer Server	Intel Xeon E5-2680 V4 processor 2.4 GHz	\$1999	9143	\$18276800
Network Switches	(a) Mellanox MSX6036F-1SFS SwitchX-2 FDR InfiniBand 36 ports (Qty 108) (b) Mellanox MSX6536-NR 648 Port FDR Capable Modular Chassis (Qty 18)	18229.00, 75225.00	108(36 Port), 18(648 port)	\$3322782
Network Cables	7m (23ft) Cisco ONS-SC+-10G-CU7 Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable	\$30.00	18287	\$548610
Racks	Server Cabinet Enclosures 42U	\$1098.99	218	\$239579.82
Storage Servers	Dell 400-AJSC 600GB SAS Hard Drive Kit	\$225.00	66667	\$15000000
Electric Power	1400W High-efficiency AC power supply with Digital Switching Control & PMBus 1.2	15.8 cents/1kwh	1400 Watt	\$88643200
Cooling	Normally 30% of electric power is cooling cost	NA	NA	\$26592900
Administration	Data Center Administrator	\$69246	9	\$3116070
Total	N/A	N/A	N/A	155Million

Amazon instance d2.8xlarge specifications are as below:

Model	vCPU*	Mem (GiB)	Storage (GB)	Network Performance
d2.xlarge	4	30.5	3 x 2000 HDD	Moderate
d2.2xlarge	8	61	6 x 2000 HDD	High
d2.4xlarge	16	122	12 x 2000 HDD	High
d2.8xlarge	36	244	24 x 2000 HDD	10 Gigabit

All instances have the following specs:

- 2.4 GHz Intel Xeon E5-2676 v3 Processor
- Intel AVX†, Intel AVX2†, Intel Turbo
- EBS Optimized
- Enhanced Networking†

Requirement:

128K cores with 2.4 GHz processors:

Thinkmate (Integrated IT Solutions, Inc.) [US] | <https://www.thinkmate.com/product/intel/bx80660e52680v4>

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FOURTEEN-CORE INTEL® XEON® PROCESSOR E5-2680 V4 2.40GHZ 35MB CACHE (120W)

Fourteen-Core Intel® Xeon® Processor E5-2680 v4 2.40GHz 35MB Cache (120W)






Intel part #: BX80660E52680V4

Price: \$1,999.00

Active

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Main Specifications

Product Type	Server
Product Line	Xeon E5-2600 v4

Total processors required: $128000/14\text{cores} = 9143$

Select OEM

Mellanox

Enter Number of Nodes in Cluster

11664 (Max Nodes)

9143

CALCULATE

Select Level 1 Switch:

36-port Switch

Select Level 2 Switch:

648-port Switch

Select Blocking Configuration:

Non-blocking

Select Switch Configuration Data Rate

☒ FDR-10 40 Gb/s

☐ QDR 40 Gb/s

☐ FDR 56 Gb/s

☐ EDR 100 Gb/s

☐ HDR 200 Gb/s

Select Adapter Configuration Data Rate

☒ FDR-10 40 Gb/s

☐ QDR 40 Gb/s

☐ FDR 56 Gb/s

☐ EDR 100 Gb/s

☐ HDR100 100 Gb/s

☐ HDR 200 Gb/s

Select Host Adapter Type

☐ Dual Port

☒ Single Port

Non-blocking Cross Bisectional Bandwidth (CBB) Configuration

			Partially Configured		
Cluster Configuration To Use	Switch	Fully Configured	Switch Count	Port Count per Switch	Line Cards per Switch
Level 1 Switches	36-port Switch	508			
Level 2 Switches	648-port Switch		18	508	29

Cables Required	
Node to Level 1 Switch Cables	9143
Level 1 Switch to Level 2 Switch Cables	9144



Mellanox MSX6036F-1SFS SwitchX-2 FDR InfiniBand 1U Switch 36 QSFP+ Ports 1 Power Supply AC PPC460 Standard Depth P2C Airflow Rail Kit RoHS6

MPN: MSX6036F-1SFS

\$18,229.00

View Details



Mellanox MSX6536-NR 648 Port FDR Capable Modular Chassis Includes 8 Fans and 10 N+N Power Supplies ROHS6 Non-Blocking Configuration Needs All Spines

MPN: MSX6536-NR

\$75,225.00

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Bulk Fiber cable





3m (10ft) Cisco ONS-SC+-10G-CU3 Compatible 10G SFP+ Passive Direct Attac Copper Twinax Cable

CISCO

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\$30.00

SKU	FOD-CIS-CU3
UPC	616175679844
Weight	1.00 LBS
Shipping	Free Shipping
Current Stock	In Stock

PRODUCT	PRICE	QTY	SUBTOTAL	
 <p>Server Cabinet Enclosures</p> <p>Height: 1 x 42U Server Rack Cabinet (81.44") \$899.99</p> <p>Freight Shipping: 1 x Standard Freight Shipping to continental US (1 per cabinet) \$199.00</p> <p>* The requested quantity for "42U Server Rack Cabinet (81.44")" is not available.</p>	\$1,098.99	<div>218</div> <p>Edit</p>	\$239,579.82	

Dell 400-AJSC 600GB SAS Hard Drive Kit



Dell Part #/MPN: 400-AJSC

★ ★ ★

DiscTech Item #: DEL-400-AJSC-BN-OE

Ship by **Thu Apr 11 2019** if ordered within **22 hour(s) 17:3 minutes**

\$225.00

BRAND NEW

Warranty: 1 Year DiscTech

In Stock

Quantity

+ ADD TO CART

ADD TO FAVORITES

ENTERPRISE GRADE

Capacity: 600GB

Storage devices: 400PB/600GB = 66,667

15.8 cents per kilowatt-hour

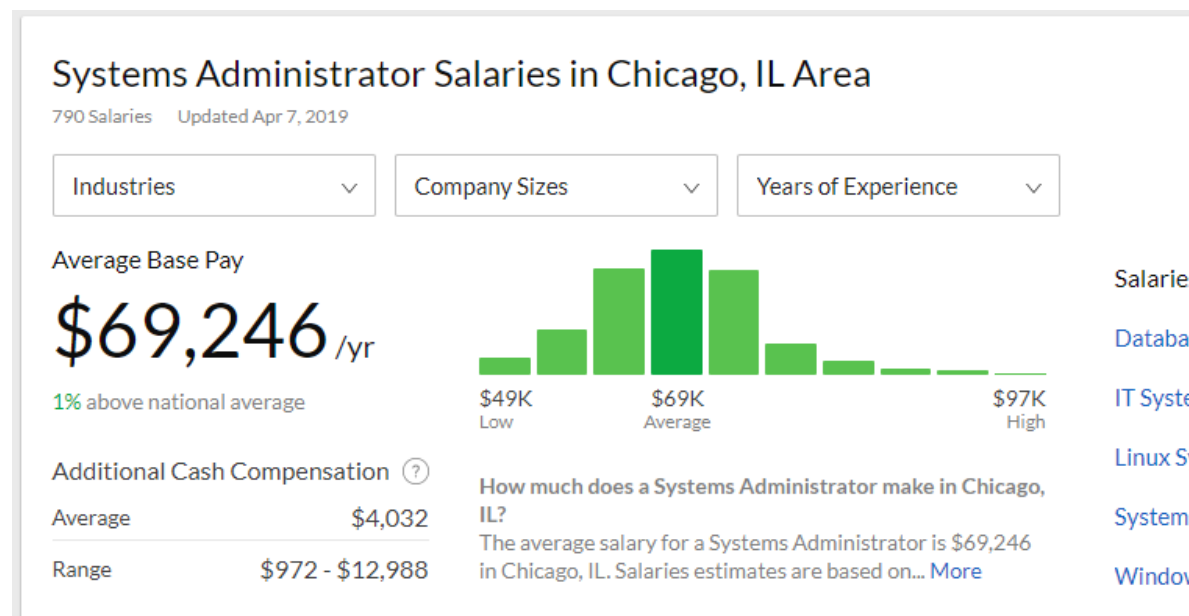
Chicago area households paid an average of **15.8 cents** per kilowatt-hour (kWh) of electricity in December 2017, up 6.8 percent from December 2016. In December, the average cost of utility (piped) gas was **85.4 cents** per therm, higher than its average price of **83.6 cents** per therm a year earlier. Jan 23, 2018

Electricity Bill Calculator

Electricity bill cost calculator. Electricity usage consumption calculator.

Select country:	United States ▾	
Typical appliance:	Desktop computer ▾	
Power consumption:	1400	watts (W) ▾
Hours of use per day:	24	h/day
1 kilowatt-hour (kWh) cost:	15.8	cent ▾
	Calculate	Reset
Electricity cost per day:	\$5.3088	
Electricity cost per month:	\$161.587	
Electricity cost per year:	\$1939.04	

Power for all machines = 1939.04 * 5 * number of machines



Public cloud:

HDD storage given: 200PB = 200000/(24*2) = 4167 Instances

Type	Description	Price per Item (Per month)	Quantity	Cost Per month	Total Price(5 Yrs)
Computer Server	d2.8xlarge Instance	\$ 4,040.64	4167	\$16837300	\$1010230000
Network Switches	N/A	N/A	N/A	N/A	N/A
Network Cables	N/A	N/A	N/A	N/A	N/A
Racks	N/A	N/A	N/A	N/A	N/A
Storage Servers	Amazon S3 Storage Classes	First 50 TB/month \$0.023 / GB	400000000.00	\$8808601.60	\$528516000
Electric Power	N/A	N/A	N/A	N/A	N/A
Cooling	N/A	N/A	N/A	N/A	N/A
Administration	AWS Support			\$271279.27	\$16276700
Total	N/A	N/A	N/A		1555Million

Compute: Amazon EC2 Instances:

	Description	Instances	Usage	Type	Billing Option	Monthly Cost
	d2.8large	1	100 % Utilized/Mo	Linux on d2.8xlarge	On-Demand (No Cor)	\$ 4040.64
	Add New Row					

Estimate of Your Monthly Bill			
<input checked="" type="checkbox"/> Show First Month's Bill (include all one-time fees, if any)			
Below you will see an estimate of your monthly bill. Expand each line item to see cost breakout of each service. To save this bill and input values, click on 'Save and Share' button. To remove the service from the estimate, jump back to the service and clear the specific service's form.			
Export to CSV		Save and Share	
	Amazon EC2 Service (US East (N. Virginia))		\$ 4040.64
	Amazon S3 Service (US East (N. Virginia))		\$ 8808601.60
	AWS Support (Business)		\$ 271279.27
Free Tier Discount:			\$ -0.12
Total Monthly Payment:			\$ 9083921.39

2. Configuration 2: Support 100K virtual machines (VM) where each VM requires 2-core, 16GB RAM, 75GB NVMe storage, and 10Gb/s Fat-Tree network (each VM should be equivalent to the r5d.large instances); 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 (for pricing comparison, see S3)

Ans:

Private Cloud:

Type	Description	Price per Item	Quantity	Total Price(5Yrs)
Computer Server	Intel Xeon processor 3.1 GHz	\$3598	1786	\$6426028
Network Switches	(a) Mellanox MSX6036F-1SFS SwitchX-2 FDR InfiniBand 36 ports (Qty 100) (b) Mellanox MSX6512-NR 216 Port FDR Capable Modular Chassis (Qty 9)	18229.00, 32065.00	100(36 Port), 9(216 port)	\$2111485
Network Cables	7m (23ft) Cisco ONS-SC+-10G-CU7 Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable	\$30.00	3577	\$107310
Racks	Server Cabinet Enclosures 42U	\$1098.99	43	\$47256.57
Storage Servers	Dell 400-AJSC 600GB SAS Hard Drive Kit	\$225.00	1667	\$375075
Electric Power	1400W High-efficiency AC power supply with Digital Switching Control & PMBus 1.2	15.8 cents/1kwh	1400 Watt	\$17315627.2
Cooling	Normally 30% of electric power is cooling cost	NA	NA	\$5194688.16
Administration	Data Center Administrator	\$69246	2	\$138492
Total	N/A	N/A	N/A	\$31Million

Public cloud:

HDD storage given: 75GB = 75/75 = 1 Instances

Type	Description	Price per Item (Per month)	Quantity	Cost Per month	Total Price(5 Yrs)
Computer Server	r5d.large Instance	\$105.41	100000	\$10541000	\$632460000
Network Switches	N/A	N/A	N/A	N/A	N/A
Network Cables	N/A	N/A	N/A	N/A	N/A
Racks	N/A	N/A	N/A	N/A	N/A
Storage Servers	Amazon S3 Storage Classes	First 50 TB/month \$0.023 / GB	1000000.00	\$22583.30	\$1354998
Electric Power	N/A	N/A	N/A	N/A	N/A
Cooling	N/A	N/A	N/A	N/A	N/A
Administration	AWS Support			\$323807.50	\$19428450
Total	N/A	N/A	N/A		653Million

Amazon instance:

r5d.large	2	16	1 x 75 NVMe SSD	up to 3,500	Up to 10
r5d.xlarge	4	32	1 x 150 NVMe SSD	up to 3,500	Up to 10
r5d.2xlarge	8	64	1 x 300 NVMe SSD	up to 3,500	Up to 10
r5d.4xlarge	16	128	2 x 300 NVMe SSD	3,500	Up to 10
r5d.12xlarge	48	384	2 x 900 NVMe SSD	7,000	10
r5d.24xlarge	96	768	4 x 900 NVMe SSD	14,000	25
r5d.metal	96*	768	4 x 900 NVMe SSD	14,000	25

*r5.metal and r5d.metal provide 96 logical processors on 48 physical cores

All instances have the following specs:

- Up to 3.1 GHz Intel Xeon Platinum Processor
- Intel AVX†, Intel AVX2†, Intel Turbo
- EBS Optimized
- Enhanced Networking†

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 INTEL® XEON® PROCESSOR W-3175X 28-CORE 3.10GHZ 38.5MB CACHE (255W)

Intel® Xeon® Processor W-3175X 28-core 3.10GHz 38.5MB Cache (255W)




 Intel part #: BX80673W3175X


Price: ~~\$3,598.00~~

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Server quantity = 100K/2 * no of cores

 Not secure
 | www.mellanox.com/clusterconfig/

Select OEM

Mellanox

Enter Number of Nodes in Cluster

3888 (Max Nodes)

1786

CALCULATE

Select Level 1 Switch:

36-port Switch

Select Level 2 Switch:

216-port Switch

Select Blocking Configuration:

Non-blocking

Select Switch Configuration Data Rate

FDR-10 40 Gb/s

QDR 40 Gb/s

FDR 56 Gb/s

EDR 100 Gb/s

HDR 200 Gb/s

Select Adapter Configuration Data Rate

FDR-10 40 Gb/s

QDR 40 Gb/s

FDR 56 Gb/s

EDR 100 Gb/s

HDR100 100 Gb/s

HDR 200 Gb/s

Select Host Adapter Type

Dual Port

Single Port

Non-blocking Cross Bisectional Bandwidth (CBB) Configuration

Cluster Configuration To Use	Switch	Fully Configured	Switch Count
Level 1 Switches	36-port Switch	100	
Level 2 Switches	216-port Switch	9	

Cables Required	
Node to Level 1 Switch Cables	1786
Level 1 Switch to Level 2 Switch Cables	1791



Mellanox MSX6036F-1SFS SwitchX-2 FDR InfiniBand 1U Switch 36 QSFP+ Ports 1 Power Supply AC PPC460 Standard Depth P2C Airflow Rail Kit RoHS6
MPN: MSX6036F-1SFS

\$18,229.00

[View Details](#)



Mellanox MSX6512-NR 216 Port FDR Capable Modular Chassis Includes 4 Fans and 4 N+N Power Supplies ROHS6 Non-Blocking Configuration Needs All Spines
MPN: MSX6512-NR

\$32,065.00

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Armored Patch Cables v

MTP MPO Fiber Cabling v

Fiber Optic Pigtails v

Ultra High Density Cables v

Direct Attach Cables v

Bulk Fiber cable



3m (10ft) Cisco ONS-SC+-10G-CU3 Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable



CISCO

[Write A Review](#)

\$30.00

SKU	FOD-CIS-CU3
UPC	616175679844
Weight	1.00 LBS
Shipping	Free Shipping
Current Stock	In Stock

The requested quantity for "42U Server Rack Cabinet (81.44")" is not available.

PRODUCT	PRICE	QTY	SUBTOTAL	
 Server Cabinet Enclosures <i>Height:</i> 1 x 42U Server Rack Cabinet (81.44") \$899.99 <i>Freight Shipping:</i> 1 x Standard Freight Shipping to continental US (1 per cabinet) \$199.00 * The requested quantity for "42U Server Rack Cabinet (81.44")" is not available	\$1,098.99	<div>43</div> Edit	\$47,256.57	

Storage device quantity = $1000000\text{GB} / 600\text{GB} = 1667$

Dell 400-AJSC 600GB SAS Hard Drive Kit



Dell Part #/MPN: 400-AJSC

★ ★ ★

DiscTech Item #: DEL-400-AJSC-BN-OE

Ship by **Thu Apr 11 2019** if ordered within **22 hour(s) 17:3 minutes**

\$225.00

BRAND NEW

Warranty: 1 Year DiscTech

In Stock

Quantity 1

+ ADD TO CART

ADD TO FAVORITES

ENTERPRISE GRADE

Capacity: 600GB

Electricity Bill Calculator

Electricity bill cost calculator. Electricity usage consumption calculator.

Select country:	United States ▾	
Typical appliance:	Desktop computer ▾	
Power consumption:	1400	watts (W) ▾
Hours of use per day:	24	h/day
1 kilowatt-hour (kWh) cost:	15.8	cent ▾
	<button>Calculate</button>	<button>Reset</button>
Electricity cost per day:	\$5.3088	
Electricity cost per month:	\$161.587	
Electricity cost per year:	\$1939.04	

Systems Administrator Salaries in Chicago, IL Area

790 Salaries Updated Apr 7, 2019

Industries ▾	Company Sizes ▾	Years of Experience ▾
--------------	-----------------	-----------------------

Average Base Pay

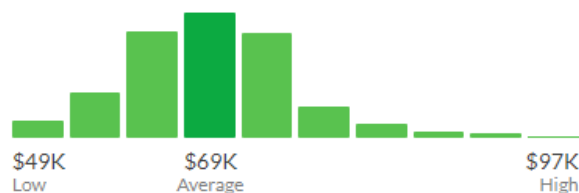
\$69,246 /yr

1% above national average

Additional Cash Compensation ?

Average \$4,032

Range \$972 - \$12,988



How much does a Systems Administrator make in Chicago, IL?

The average salary for a Systems Administrator is \$69,246 in Chicago, IL. Salaries estimates are based on... [More](#)

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IT Systems

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Services **Estimate of your Monthly Bill (\$ 10887390.68)**

Estimate of Your Monthly Bill
☒ Show First Month's Bill (include all one-time fees, if any)

Below you will see an estimate of your monthly bill. Expand each line item to see cost breakout of each service. To save this bill and input values, click on 'Save and Share' button. To remove the service from the estimate, jump back to the service and clear the specific service's form.

[Export to CSV](#) [Save and Share](#)

Amazon EC2 Service (US East (N. Virginia))	\$ 10541000.00
Amazon S3 Service (US East (N. Virginia))	\$ 22583.30
AWS Support (Business)	\$ 323807.50
Free Tier Discount:	\$ -0.12
Total Monthly Payment:	\$ 10887390.68

Configuration 3: Support deep learning with 10 exaflop of double 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 10PB distributed storage shared across the entire cloud should be procured, with enough capacity for 100GB/sec throughput (for pricing comparison, see S3)

Ans:

Private Cloud:

Type	Description	Price per Item	Quantity	Total Price(5Yrs)
Computer Server	2 GPX XS3-11S1-2GPU Top of Form (Intel® Xeon® Gold 6248 Processor 20-Core 2.5GHz 28MB Cache),2 256GB DDR & 8 NVIDIA V100	\$79066	999	\$78986900
Network Switches	(a) Mellanox MSX6036F-1SFS SwitchX-2 FDR InfiniBand 36 ports (Qty 56) (b) Mellanox MSX6512-NR 216 Port FDR Capable Modular Chassis (Qty 6)	\$18229.00, \$32065.00	56(36 Port), 6(216 port)	\$1213214
Network Cables	7m (23ft) Cisco ONS-SC+-10G-CU7 Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable	\$30.00	2001	\$60030
Racks	Server Cabinet Enclosures 42U	\$1098.99	48	\$52751.52

Storage Servers	Dell 400-AJSC 600GB SAS Hard Drive Kit	\$225.00	16667	\$3750075
Electric Power	1400W High-efficiency AC power supply with Digital Switching Control & PMBus 1.2	15.8 cents/1kwh	1400*2 Watt = 2800	\$19371000
Cooling	Normally 30% of electric power is cooling cost	NA	NA	\$5811302
Administration	Data Center Administrator	\$69246	1	\$69246
Total	N/A	N/A	N/A	\$109Millions

Features:

- Up to 8 NVIDIA Tesla V100 GPUs, each pairing 5,120 CUDA Cores and 640 Tensor Cores
- High frequency Intel Xeon E5-2686 v4 (Broadwell) processors for p3.2xlarge, p3.8xlarge, and p3.16xlarge.
- High frequency 2.5 GHz (base) Intel Xeon P-8175M processors for p3dn.24xlarge.
- Supports NVLink for peer-to-peer GPU communication
- Provides up to 100 Gbps of aggregate network bandwidth within a Placement Group.

Model	GPUs	vCPU	Mem (GiB)	GPU Mem (GiB)	GPU P2P	Storage (GiB)	Dedicated EBS Bandwidth	Networking Performance
p3.2xlarge	1	8	61	16	-	EBS-Only	1.5 Gbps	Up to 10 Gigabit
p3.8xlarge	4	32	244	64	NVLink	EBS-Only	7 Gbps	10 Gigabit
p3.16xlarge	8	64	488	128	NVLink	EBS-Only	14 Gbps	25 Gigabit

Server price = 2 * Processor + 2 * Memory + 8 * GPU

Thinkmate (Integrated IT Solutions, Inc.) [US] | <https://www.thinkmate.com/hardware/processors?a=YToyOntpOjU7YToxOntpOjA7YToyOntpOjA7ZDoyLjEwM...>

Socket


LGA2011-v3 (14)

Clock Speed

2.60 GHz (3)
2.40 GHz (3)
2.30 GHz (1)
2.20 GHz (4)
2.10 GHz (3)

Compare

Intel part #: BX80660E52697V4



Fourteen-Core Intel® Xeon® Processor E5-2680 v4 2.40GHz 35MB Cache (120W)
Server, Xeon E5-2600 v4, LGA2011-v3, 2.40 GHz, 9.6 GT/s, Dual Lanes, Broadwell-EP


\$1,999.00

Active

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Compare

Intel part #: BX80660E52680V4



Fourteen-Core Intel® Xeon® Processor E5-2690 v4 2.60GHz 35MB Cache (135W)
Server, Xeon E5-2600 v4, LGA2011-v3, 2.60 GHz, 9.6 GT/s, Dual Lanes, Broadwell-EP

\$2,349.00

Active

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Compare

Intel part #: BX80660E52690V4

A-Tech 256GB Kit (2 x 128GB) for Dell PowerEdge R730 - DDR4 PC4-21300 2666Mhz ECC Load Reduced LRDIMM 8Rx4 - Server Specific Memory Ram (AT316643SRV-X2L4)

by A-Tech Components
Be the first to review this item



Price: **\$4,404.46** & **FREE Shipping**

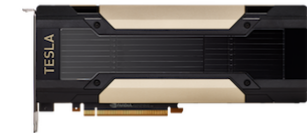
Get \$50 off instantly; Pay \$4,354.46 upon approval for the Amazon Rewards Visa Card.

Capacity: **128GB 2666MHz (PC4-21300) 8Rx4**

32GB 2400MHz (PC4-19200) 2Rx4

32GB 2666MHz (PC4-21300) 2Rx4

64GB 2666MHz (PC4-21300) 4Rx4



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NVIDIA Tesla V100 GPU 32GB HBM2 Volta
CUDA PCIe 900-2G500-0010-000 for Deep
Learning Artificial Intelligence Finance Oil
Gas CAD Physics Research IoT

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~~\$9,995.00~~ **\$8,195.00**

Besides ~20% discount, the sale price above includes NVIDIA V100 Boost Promo Discount of \$250!

The NVIDIA Tesla V100 32GB is the world's most advanced data center GPU ever built to accelerate AI,

Select OEM

Mellanox

Enter Number of Nodes in Cluster

3888 (Max Nodes)

999

CALCULATE

Select Level 1 Switch:

36-port Switch

Select Level 2 Switch:

216-port Switch

Select Blocking Configuration:

Non-blocking

Select Switch Configuration Data Rate

☒ FDR-10 40 Gb/s

☐ QDR 40 Gb/s

☐ FDR 56 Gb/s

☐ EDR 100 Gb/s

☐ HDR 200 Gb/s

Select Adapter Configuration Data Rate

☒ FDR-10 40 Gb/s

☐ QDR 40 Gb/s

☐ FDR 56 Gb/s

☐ EDR 100 Gb/s

☐ HDR 100 100 Gb/s

☐ HDR 200 Gb/s

Select Host Adapter Type

☐ Dual Port

☒ Single Port

Non-blocking Cross Bisectonal Bandwidth (CBB) Configuration

Cluster Configuration To Use	Switch	Fully Configured	Partially Configured		
			Switch Count	Port Count per Switch	Line Cards per Switch
Level 1 Switches	36-port Switch	56			
Level 2 Switches	216-port Switch		6	167	10

Cables Required	
Node to Level 1 Switch Cables	999
Level 1 Switch to Level 2 Switch Cables	1002



Mellanox MSX6036F-1SFS SwitchX-2 FDR InfiniBand 1U Switch 36 QSFP+ Ports 1 Power Supply AC PPC460 Standard Depth P2C Airflow Rail Kit RoHS6
MPN: MSX6036F-1SFS

\$18,229.00

[View Details](#)



Mellanox MSX6512-NR 216 Port FDR Capable Modular Chassis Includes 4 Fans and 4 N+N Power Supplies ROHS6 Non-Blocking Configuration Needs All Spines
MPN: MSX6512-NR

\$32,065.00

[View Details](#)



Categories

Fiber Optic Patch Cables ^

Fiber Patch Cables v

Armored Patch Cables v

MTP MPO Fiber Cabling v

Fiber Optic Pigtails v

Ultra High Density Cables v

Direct Attach Cables v

Bulk Fiber cable



3m (10ft) Cisco ONS-SC+-10G-CU3 Compatible 10G SFP+ Passive Direct Attach Copper Twinax Cable

CISCO



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\$30.00

SKU	FOD-CIS-CU3
UPC	616175679844
Weight	1.00 LBS
Shipping	Free Shipping
Current Stock	In Stock

Shopping Cart

The requested quantity for "42U Server Rack Cabinet (81.44")" is not available.

PRODUCT	PRICE	QTY	SUBTOTAL
 Server Cabinet Enclosures <i>Height:</i> 1 x 42U Server Rack Cabinet (81.44") \$899.99 <i>Freight Shipping:</i> 1 x Standard Freight Shipping to continental US (1 per cabinet) \$199.00 * The requested quantity for "42U Server Rack Cabinet (81.44")" is not available.	\$1,098.99	<input type="text" value="48"/> Edit	\$52,751.52 
Empty Cart Update Shopping Cart -OR- Continue Shopping			

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Dell 400-AJSC 600GB SAS Hard Drive Kit



Dell Part #/MPN: 400-AJSC
DiscTech Item #: DEL-400-AJSC-BN-OE

★ ★ ★ 1

Ship by **Thu Apr 11 2019** if ordered within **22 hour(s) 17:3 minutes**

\$225.00

BRAND NEW

Warranty: 1 Year DiscTech

In Stock

Quantity 1

+ ADD TO CART

ADD TO FAVORITES

ENTERPRISE GRADE

Capacity: 600GB

Electricity Bill Calculator

Electricity bill cost calculator. Electricity usage consumption calculator.

Select country: **United States**

Typical appliance: **Desktop computer**

Power consumption: **2800** watts (W)

Hours of use per day: **24** h/day

1 kilowatt-hour (kWh) cost: **15.8** cent

Calculate **Reset**

Electricity cost per day: **\$10.6176**

Electricity cost per month: **\$323.173**

Electricity cost per year: **\$3878.08**

Systems Administrator Salaries in Chicago, IL Area

790 Salaries Updated Apr 7, 2019

Industries Company Sizes Years of Experience

Average Base Pay

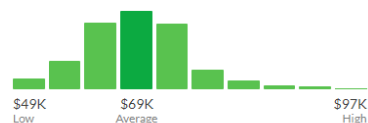
\$69,246 /yr

1% above national average

Additional Cash Compensation

Average \$4,032

Range \$972 - \$12,988




How much does a Systems Administrator make in Chicago, IL?
The average salary for a Systems Administrator is \$69,246 in Chicago, IL. Salaries estimates are based on... [More](#)

Salaries
Database
IT Systems
Linux
System
Windows

HDD storage given: 10PB = 10000/(24*2) = 4167 Instances

Type	Description	Price per Item (Per month)	Quantity	Cost Per month	Total Price(5 Yrs)
Computer Server	p3.16xlarge Instance	\$17919	999	\$ 17901440.64	\$1074060000
Network Switches	N/A	N/A	N/A	N/A	N/A
Network Cables	N/A	N/A	N/A	N/A	N/A
Racks	N/A	N/A	N/A	N/A	N/A
Storage Servers	Amazon S3 Storage Classes	First 50 TB/ month \$0.023 / GB	10000000.00	\$220764.16	\$13245800
Electric Power	N/A	N/A	N/A	N/A	N/A
Cooling	N/A	N/A	N/A	N/A	N/A
Administration	AWS Support			\$550566.15	\$33033900
Total	N/A	N/A	N/A		1120Million



SIMPLE MONTHLY CALCULATOR

Language

Need Help? [Watch the Videos](#) or [Read How AWS Pricing Works](#)

Get Started with AWS: [Learn more about our Free Tier](#) or [Sign Up for an AWS Account](#) »

☒ FREE USAGE TIER: New Customers get free usage tier for first 12 months

Reset All
Services
Estimate of your Monthly Bill (\$ 18672770.83)

Amazon EC2

Amazon S3

Amazon Route 53

Amazon CloudFront

Amazon RDS

Amazon Elastic Load Balancing

Amazon DynamoDB

Estimate of Your Monthly Bill

☒ Show First Month's Bill (includes all one-time fees, if any)

Below you will see an estimate of your monthly bill. Expand each line item to see cost breakout of each service. To save this bill and input values, click on 'Save and Share' button. To remove the service from the estimate, jump back to the service and clear the specific service's form.

Export to CSV
Save and Share

Service	Estimated Monthly Cost
+ Amazon EC2 Service (US East (N. Virginia))	\$ 17901440.64
+ Amazon S3 Service (US East (N. Virginia))	\$ 220764.16
+ AWS Support (Business)	\$ 550566.15
Free Tier Discount:	\$ -0.12
Total Monthly Payment:	\$ 18672770.83

Summary:

	Configuration 1 (Million)	Configuration 2 (Million)	Configuration 3 (Million)
Public Cloud (including EC2 and S3) Cost over 5 years, 24/7 operation, with 100% usage.	\$1555	\$653	\$1120
Private Cloud cost over 5 years, 24/7 operation, with 100% usage	\$155	\$31	\$109
What utilization must be achieved with the private cloud to make the private cloud option more attractive than the public cloud?	9.97%	4.74%	9.73%
Summary	Private cloud only costs 9.97% of AWS	Private cloud only costs 4.74% of AWS	Private cloud only costs 9.73% of AWS