

Configuration1:

Public Cloud for configuration 1: AWS

Each d3.8xlarge instance have 32 CPU. We require a total of 5000 EC2 instances to meet 160K core requirement.

Amazon EC2	Overview	Features	Pricing	Instance Types ▾	FAQs	Getting Started	Resources ▾
PAGE CONTENT							
<u>General Purpose</u>	Instance Size	vCPU	Memory (GiB)	Instance Storage (TB)	Aggregate Disk Throughput (MiB/s)	Network Bandwidth (Gbps)***	EBS Bandwidth (Mbps)
<u>Compute Optimized</u>	d3.xlarge	4	32	3 x 2 HDD	580	Up to 15	850
<u>Memory Optimized</u>	d3.2xlarge	8	64	6 x 2 HDD	1,100	Up to 15	1,700
<u>Accelerated Computing</u>	d3.4xlarge	16	128	12 x 2 HDD	2,300	Up to 15	2,800
<u>Storage Optimized</u>	d3.8xlarge	32	256	24 x 2 HDD	4,600	25	5,000
<u>HPC Optimized</u>	*128k block sizes, sequential read and write (rounded to nearest 100 except for xlarge)						
<u>Instance Features</u>	...						

Amazon EC2 configuration:

AWS Pricing Calculator > My Estimate > Edit Amazon EC2

Edit Amazon EC2 [Info](#)

Description

Choose a location type [Info](#)
Region

EC2 specifications [Info](#)

Tenancy
Choose the tenancy type to run your Amazon EC2 instances on.
 Shared Instances

Operating system
Choose the operating system to run your Amazon EC2 instances on.
 Linux

Total Upfront cost: 0.00 USD
Total Monthly cost: 15,735,648.00 USD

Show Details [▼](#) [Update](#) [Cancel](#)

Linux

Workloads
Choose the graph that best represents your monthly workload
 Constant usage Daily spike traffic Weekly spike traffic Monthly spike traffic

Number of instances
Please specify the total number of Instances that you need each month.

EC2 Instances (695)
Based on your inputs, this is the lowest-cost EC2 instance: **t4g.nano**
Chosen instance: **d3.8xlarge** | Family: **d3** | 32vCPU | 256 GiB Memory

Search instance type

Instance family [Info](#)
 vCPUs Memory (GiB) Network performance

Show only current generation instances.

[Show Details](#) [▼](#) [Cancel](#) [Update](#)

'total Upfront cost: 0.00 USD
'total Monthly cost: 15,735,648.00 USD

aws pricing calculator

Feedback Language: English Contact Sales Create an AWS Account

Instance name	vCPUs	Memory	Network Performance	Storage	On-Demand Hourly Cost	CurrentGeneration	Potential Effective Hourly Cost (Savings %)
<input type="radio"/> t4g.nano	2	0.5 GiB	Up to 5 Gigabit	EBS only	0.0042	Yes	0.0016 (63%)
<input type="radio"/> t3a.nano	2	0.5 GiB	Up to 5 Gigabit	EBS only	0.0047	Yes	0.0018 (63%)
<input type="radio"/> t3.nano	2	0.5 GiB	Up to 5 Gigabit	EBS only	0.0052	Yes	0.0019 (63%)
<input type="radio"/> t2.nano	1	0.5 GiB	Low	EBS only	0.0058	Yes	0.0022 (63%)
<input type="radio"/> t4g.micro	2	1 GiB	Up to 5 Gigabit	EBS only	0.0084	Yes	0.0032 (62%)
<input type="radio"/> t3a.micro	2	1 GiB	Up to 5 Gigabit	EBS only	0.0094	Yes	0.0035 (62%)
<input type="radio"/> t3.micro	2	1 GiB	Up to 5 Gigabit	EBS only	0.0104	Yes	0.0039 (62%)
<input type="radio"/> t2.micro	1	1 GiB	Low to Moderate	EBS only	0.0116	Yes	0.0044 (62%)
<input type="radio"/> t4g.small	2	2 GiB	Up to 5 Gigabit	EBS only	0.0168	Yes	0.0063 (62%)
<input type="radio"/> t3a.small	2	2 GiB	Up to 5 Gigabit	EBS only	0.0188	Yes	0.0071 (62%)

Payment options

Total Upfront cost: 0.00 USD
Total Monthly cost: 15,735,648.00 USD

Show Details ▾

Cancel

Update

Estimated commitment price based on the following selections:
Instance type: **d3.8xlarge** Operating system: **Linux**

Select the container and options to find your best price

Compute Savings Plans
One plan that automatically applies to all usage on EC2, Fargate, and Lambda. Up to 66% discount. [Learn more](#)

Reservation term
 1 year
 3 year

Payment Options
 No upfront
 Partial upfront
 All upfront

Upfront: 0.00
Monthly: 1512.03/Month

EC2 Instance Savings Plans
Get deeper discount when you only need one instance family and region. Up to 72% discount. [Learn more](#)

Reservation term
 1 year
 3 year

Payment Options
 No upfront
 Partial upfront
 All upfront

Upfront: 0.00
Monthly: 1260.02/Month

On-Demand
Maximize flexibility. [Learn more](#)

Expected utilization
Enter the expected usage of Amazon EC2 instances

Usage
100

Usage type
Utilization percent per month

Instance: 3.99552/Hour
Monthly: 2916.73/Month

Spot Instances
Minimize cost by leveraging EC2's spare capacity. Recommended for fault tolerant and interruption tolerant applications. [Learn more](#)

The historical average discount for d3.8xlarge is 86%

Assume percentage discount for my estimate
86

Actual spot instance pricing varies
With spot instances, you pay the spot price that's in effect for the time period your instance is running

Instance: 3.99552/Hour
Monthly: 2041710.72/Month

Total Upfront cost: 0.00 USD
Total Monthly cost: 15,735,648.00 USD

Show Details ▾

Cancel

Update

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aws pricing calculator

Feedback Language: English Contact Sales Create an AWS Account

▼ Amazon Elastic Block Store (EBS) - **optional** Info

Calculating EBS snapshots
[Learn more](#) on how EBS snapshot prices are calculated.

Storage for each EC2 instance
Choose EBS volume storage type.

Throughput Optimized HDD (st 1)

Storage amount Unit
5 TB

Snapshot Frequency
No snapshot storage

► Show calculations

► Detailed monitoring - **optional** Info

Total Upfront cost: 0.00 USD
Total Monthly cost: 15,735,648.00 USD

Show Details ▾

Cancel

Update

On demand pricing per month: \$15,735,648.00

Price for 1 year: \$188,827,776.00

Price for 5 years: \$944,138,880.00

As the per the requirement need reserved instance pricing with a standard 5-year term. As there is no standard 5-year option, calculating reserved instance pricing for standard 3 years and standard 1 year twice, which will give the pricing for the amazon EC2 instance reservation for 5 years.

Standard 3 years:

Number of instances
Please specify the total number of Instances that you need each month.

EC2 Instances (695)
Based on your inputs, this is the lowest-cost EC2 instance: **t4g.nano**
Chosen instance: **d3.8xlarge** | Family: **d3** | 32vCPU | 256 GiB Memory

Search instance type

Instance family [Info](#)

Any Instance family	vCPUs	Memory (GiB)	Network performance
---------------------	-------	--------------	---------------------

Show only current generation instances.

Amazon Pricing Calculator

Instance type: **d3.8xlarge** Operating system: **Linux**

Select the container and options to find your best price

<input type="radio"/> Compute Savings Plans One plan that automatically applies to all usage on EC2, Fargate, and Lambda. Up to 66% discount. Learn more Reservation term <input type="radio"/> 1 year <input checked="" type="radio"/> 3 years Payment Options <input checked="" type="radio"/> No upfront <input type="radio"/> Partial upfront <input type="radio"/> All upfront Upfront: 0.00 Monthly: 1512.03/Month	<input type="radio"/> EC2 Instance Savings Plans Get deeper discount when you only need one instance family and region. Up to 72% discount. Learn more Reservation term <input type="radio"/> 1 year <input checked="" type="radio"/> 3 years Payment Options <input checked="" type="radio"/> No upfront <input type="radio"/> Partial upfront <input type="radio"/> All upfront Upfront: 0.00 Monthly: 1260.02/Month	<input type="radio"/> On-Demand Maximize flexibility. Learn more Expected utilization Enter the expected usage of Amazon EC2 instances Usage <input type="text" value="100"/> Usage type <input type="text" value="Utilization percent per month"/> Instance: 3.99552/Hour Monthly: 2916.73/Month	<input type="radio"/> Spot Instances Minimize cost by leveraging EC2's spare capacity. Recommended for fault tolerant and interruption tolerant applications. Learn more The historical average discount for d3.8xlarge is 86% Assume percentage discount for my estimate <input type="text" value="86"/> Actual spot instance pricing varies With spot instances, you pay the spot price that's in effect for the time period your instance is running
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Total Upfront cost: 0.00 USD
Total Monthly cost: 7,452,119.00 USD

Show Details ▾

Cancel Update

▼ Other purchasing options

<input checked="" type="radio"/> Standard Reserved Instances Learn about Standard Reserved Instances Reservation term <input type="radio"/> 1 year <input checked="" type="radio"/> 3 years Payment Options <input checked="" type="radio"/> No upfront <input type="radio"/> Partial upfront <input type="radio"/> All upfront Upfront: 0.00 Monthly: 1260.02/Month	<input type="radio"/> Convertible Reserved Instances Learn more Reservation term <input type="radio"/> 1 year <input checked="" type="radio"/> 3 years Payment Options <input checked="" type="radio"/> No upfront <input type="radio"/> Partial upfront <input type="radio"/> All upfront Upfront: 0.00 Monthly: 1512.03/Month
--	---

Show calculations

Total Upfront cost: 0.00 USD
Total Monthly cost: 7,452,119.00 USD

Show Details ▾

Cancel Update

▼ Amazon Elastic Block Store (EBS) - *optional* [Info](#) [C](#)

Calculating EBS snapshots
[Learn more](#) on how EBS snapshot prices are calculated.

Storage for each EC2 instance
 Choose EBS volume storage type.
 Throughput Optimized HDD (st 1)

Storage amount Unit

Snapshot Frequency

► Show calculations

► Detailed monitoring - *optional* [Info](#)

Total Upfront cost: 0.00 USD
 Total Monthly cost: 7,452,119.00 USD

Show Details [▼](#) [Cancel](#) [Update](#)

AWS Pricing Calculator > My Estimate

My Estimate [Edit](#) [C](#)

[Export](#) [▼](#) [Share](#)

Estimate summary [Info](#)

Upfront cost 0.00 USD	Monthly cost 7,452,119.00 USD	Total 12 months cost 89,425,428.00 USD Includes upfront cost
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My Estimate

<input type="checkbox"/>	Service Name	Status	Upfront cost	Monthly cost	Description	Region	Config Summary
<input type="checkbox"/>	Amazon EC2	-	0.00 USD	7,452,119.00 USD	-	US East (Ohio)	Tenancy (Shared Instance...)

Standard 1 year:

AWS Pricing Calculator > My Estimate > Edit Amazon EC2

Edit Amazon EC2 [Info](#)

Description

Choose a location type [Info](#)
 Region Choose a Region

EC2 specifications [Info](#)

Tenancy
 Choose the tenancy type to run your Amazon EC2 instances on.
 Shared Instances

Operating system
 Choose the operating system to run your Amazon EC2 instances on.
 Linux

Workloads
Choose the graph that best represents your monthly workload

Constant usage Daily spike traffic Weekly spike traffic Monthly spike traffic

Number of instances
Please specify the total number of instances that you need each month.

5000

EC2 Instances (695)
Based on your inputs, this is the lowest-cost EC2 instance: **t4g.nano**
Chosen instance: **d3.8xlarge** | Family: **d3** | 32vCPU | 256 GiB Memory

Search instance type:

Instance family [Info](#) vCPUs Memory (GiB) Network performance

Any Instance family Any vCPUs Any Memory (GiB) Any Network Performance

Show only current generation instances.

1 2 3 4 5 6 7 ... 70

Instance name	vCPUs	Memory	Network Performance	Storage	On-Demand Hourly Cost	CurrentGeneration	Potential Effective Hourly

Total Upfront cost: 0.00 USD Total Monthly cost: 10,339,707.00 USD Show Details

[Cancel](#) [Update](#)

AWS pricing calculator

[Feedback](#) [Language: English](#) [Contact Sales](#) [Create an AWS Account](#)

Payment options

Estimated commitment price based on the following selections:
Instance type: **d3.8xlarge** Operating system: **Linux**

Select the container and options to find your best price

Compute Savings Plans
One plan that automatically applies to all usage on EC2, Fargate, and Lambda. Up to 66% discount. [Learn more](#)

Reservation term
 1 year 3 year

Payment Options
 No upfront Partial upfront All upfront

EC2 Instance Savings Plans
Get deeper discount when you only need one instance family and region. Up to 72% discount. [Learn more](#)

Reservation term
 1 year 3 year

Payment Options
 No upfront Partial upfront All upfront

On-Demand
Maximize flexibility. [Learn more](#)

Expected utilization
Enter the expected usage of Amazon EC2 instances

Usage:

Usage type:

Spot Instances
Minimize cost by leveraging EC2's spare capacity. Recommended for fault tolerant and interruption tolerant applications. [Learn more](#)

The historical average discount for d3.8xlarge is 86%

Assume percentage discount for my estimate:

Actual spot instance pricing varies
With spot instances, you pay the spot price that's in effect for the time period your instance is running

Total Upfront cost: 0.00 USD Total Monthly cost: 10,339,707.00 USD Show Details

[Cancel](#) [Update](#)

Other purchasing options

Standard Reserved Instances
[Learn about Standard Reserved Instances](#)

Reservation term
 1 year 3 year

Payment Options
 No upfront Partial upfront All upfront

Upfront: 0.00
Monthly: 1837.54/Month

Convertible Reserved Instances
[Learn more](#)

Reservation term
 1 year 3 year

Payment Options
 No upfront Partial upfront All upfront

Upfront: 0.00
Monthly: 1512.03/Month

Show calculations

Total Upfront cost: 0.00 USD Total Monthly cost: 10,339,707.00 USD Show Details

[Cancel](#) [Update](#)

The screenshot shows the AWS Pricing Calculator interface. At the top, a section for 'Amazon Elastic Block Store (EBS) - optional' is expanded, showing a note about calculating EBS snapshots and a dropdown for throughput optimized HDD (st 1). Below this, fields for storage amount (5 TB) and snapshot frequency ('No snapshot storage') are set. A 'Show calculations' button is visible. At the bottom, the total upfront cost is listed as 0.00 USD and the total monthly cost as 10,339,707.00 USD. A 'Show Details' button and an 'Update' button are present.

Successfully updated Amazon EC2 estimate.

My Estimate [Edit](#)

Estimate summary [Info](#)

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	10,339,707.00 USD	124,076,484.00 USD Includes upfront cost

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My Estimate

Service Name	Status	Upfront cost	Monthly cost	Description	Region	Config Summary
Amazon EC2	-	0.00 USD	10,339,707.00 USD	-	US East (Ohio)	Tenancy (Shared Instance...)

For the reserved instance standard 3-year period:

Per month: \$7,452,119.00

Cost for 1 year: \$89,425,428.00

Cost for 3 years: \$268,276,284.00

For the reserved instance standard 1-year period:

Per month: \$10,339,707.00

Cost for 1 year: \$124,076,484.00

Total cost= 3 years reserved standard price+2(1 year reserved standard price)

$$= \$268,276,284.00 + 2(\$124,076,484.00)$$

Total EC2 instance cost= \$516,429,252.00

Amazon S3 Storage:

AWS Pricing Calculator > My Estimate > Edit Amazon Simple Storage Service (S3)

Edit Amazon Simple Storage Service (S3) [Info](#)

Description

Choose a location type [Info](#)
Region:

Choose a Region

Select S3 Storage classes and other features [Info](#)
Select AWS services that you want to estimate

S3 Standard S3 Intelligent - Tiering S3 Standard - Infrequent Access
 S3 One Zone - Infrequent Access S3 Glacier Flexible Retrieval S3 Glacier Deep Archive
 S3 Management and Insights S3 Object Lambda S3 Glacier Instant Retrieval

Total Upfront cost: 0.00 USD | Total Monthly cost: 3,626,956.80 USD | Show Details ▾ | [Cancel](#) | [Update](#)

S3 Standard feature

▼ S3 Standard [Info](#)

The calculations below exclude Free Tier discounts.

S3 Standard storage Unit:

How will data be moved into S3 Standard?
Automatically calculates PUT, COPY, POST costs for moving data into S3 Standard initially. To compare the cost of current storage in S3 Standard to lifecycle this data to another storage class, you can specify that your storage is already stored in S3 Standard while selecting Lifecycle under the new storage class to capture the upfront cost of moving your data.

The specified amount of data is already stored in S3 Standard

PUT, COPY, POST, LIST requests to S3 Standard
Ongoing monthly number of PUT, COPY, POST or LIST requests
Enter amount of requests

GET, SELECT, and all other requests from S3 Standard
Ongoing monthly number of GET, SELECT and all other requests
Enter amount of requests

Total Upfront cost: 0.00 USD | Total Monthly cost: 3,626,956.80 USD | Show Details ▾ | [Cancel](#) | [Update](#)

Data returned by S3 Select
Ongoing monthly volume of data returned by S3 Select requests

Value Unit:

Data scanned by S3 Select
Ongoing monthly volume of data scanned by S3 Select requests

Value Unit:

► Show calculations

Data Transfer feature

▼ Data Transfer [Info](#)

Total Upfront cost: 0.00 USD | Total Monthly cost: 3,626,956.80 USD | Show Details ▾ | [Cancel](#) | [Update](#)

Data Transfer feature

▼ Data Transfer [Info](#)

Inbound Data Transfer
Enter the data you expect to transfer into US East (Ohio)

Data transfer from
Internet (free) **Enter Amount** 48000 **Data amount** TB per month

Add inbound data transfer

Outbound Data Transfer
Enter the data you expect to transfer out of US East (Ohio)

Data transfer to
Internet (0.05 USD - 0.09 USD per GB) **Enter Amount** 48000 **Data amount** TB per month

Add outbound data transfer

Show calculations

Total Upfront cost: 0.00 USD **Total Monthly cost: 3,626,956.80 USD**

[Show Details ▾](#) [Cancel](#) [Update](#)

[AWS Pricing Calculator](#) > [My Estimate](#)

My Estimate [Edit](#) [Export](#) [Share](#)

Estimate summary [Info](#)

Upfront cost 0.00 USD	Monthly cost 3,626,956.80 USD	Total 12 months cost 43,523,481.60 USD Includes upfront cost
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My Estimate

<input type="checkbox"/> Service Name	Status	Upfront cost	Monthly cost	Description	Region	Config Summary
<input type="checkbox"/> Amazon Simple Storage ...	-	0.00 USD	3,626,956.80 USD	-	US East (Ohio)	S3 Standard storage (480...

S3 storage cost per month: \$3,626,956.80

S3 storage cost for 1 year: \$ 43,523,481.60

S3 storage cost for 5 years: \$ 217,617,408.00

Cost for public cloud AWS for configuration 1 for 5 years:

Ec2 reserved instance for standard 5 years + S3 storage cost for 5 years:

$$= 516,429,252.00 + 217,617,408.00$$

$$= 734,046,660$$

Cost for public cloud AWS for configuration 1 for 5 years: \$734,046,660.00

Private Cloud for configuration 1:

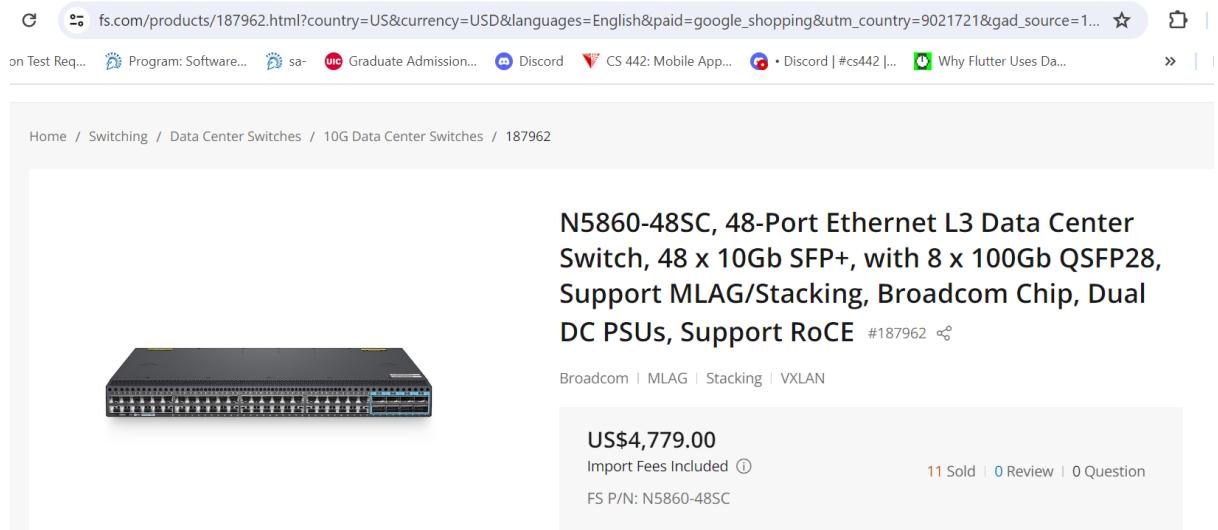
	Description	Price Per Item	Quantity	Total Price
Compute Servers	GPX XH12-24S4-10GPU Intel® C741 Chipset - 4U GPU Server - 12x 3.5" Hybrid - Dual 10-Gigabit Ethernet - 3000W 3+1 Redundant Power Supply 2 x Intel® Xeon® Silver 4416+ Processor 20-Core 2.0GHz 37.5 MB Cache (165W) 16 x 16GB PC5-38400 4800MHz DDR5 ECC RDIMM 6TB SATA 6.0Gb/s 7200RPM - 3.5" - Ultrastar™ DC HC310 (512e) Broadcom NetXtreme 1-Gigabit Ethernet Network Adapter - PCIe 2.0 x1 - 2x RJ45 4 x IEC320 C19 to NEMA 5-15P Power Cable, 14AWG, 125V/15A, Black - 3ft Ubuntu Linux 22.04 LTS Server Edition (64-bit), 125V/15A, Black - 3ft	\$17,094.00	4000	\$ 68,376,000.00
Network Switches	N5860-48SC 48-Port Ethernet L3 Data Center Switch, 48 x 10Gb SFP+, with 8 x 100Gb QSFP28, Support MLAG/Stacking, Broadcom Chip, Dual DC PSUs, Support RoCE	\$4,779	84	\$401,436
Network Cables	3m (10ft) Cisco QSFP-100G-CU3M Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	\$54	4167	\$225,018
Racks	48U 151DC Data Center Rack 24in x 48in (WxD)	\$1910	346	\$660,860
Storage Servers	STX-JB JE78-0420-TL Thinkmate® STX-4378 4U Chassis - 78x 3.5" SATA3/SAS3 - 24Gb/s SAS Dual Expander - 1600W 1+1 Redundant Power 20 x 16TB SATA 6.0Gb/s 7200RPM - 3.5" - Ultrastar™ DC HC550 (512e/4Kn) I have an existing Host Server or Adapter AC Power Cord (North America), C13, NEMA 5-15P, 3 ft. CAB-AC	\$16,848.71	150	\$2,527,306.50
Electric Power	Power consumed by compute and storage servers	\$0.10	Refer Electricity Cost Calculation below	\$21,133,500
Cooling	Assuming cooling cost is same as the amount of cost occurred for power consumption	-	-	\$21,133,500
Administration	Salary for system administrator	\$83,437	8	\$3,337,480
TOTAL				\$117,795,100.5

Network Switches:

Number of switches required to connect servers = $4000/48 \sim 84$

Cost of 1 48 port switch is \$4,779

Total cost for network switch = $4779 \times 84 = \$401,436$



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on Test Req... Program: Software... sa- Graduate Admission... Discord CS 442: Mobile App... Discord | #cs442 |... Why Flutter Uses Da... » ⋮

Home / Switching / Data Center Switches / 10G Data Center Switches / 187962

N5860-48SC, 48-Port Ethernet L3 Data Center Switch, 48 x 10Gb SFP+, with 8 x 100Gb QSFP28, Support MLAG/Stacking, Broadcom Chip, Dual DC PSUs, Support RoCE #187962

Broadcom | MLAG | Stacking | VXLAN

US\$4,779.00
Import Fees Included ⓘ 11 Sold | 0 Review | 0 Question
FS P/N: N5860-48SC

Network Cables:

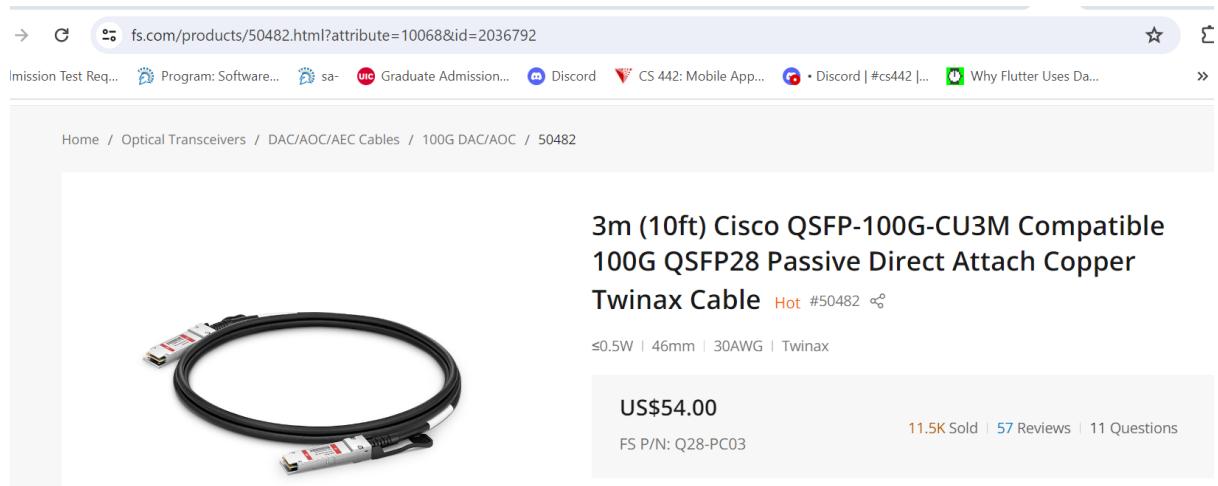
Each network cable cost \$54.

As per the fat tree network design, the network cables required are as follow.

4000 servers require 4000 cables.

As there are 84 switches with 48 ports each, 83 network cables are required to connect all the switches. 84 cables required to connect switches to servers.

Total 4167 cables cost = $4167 \times 54 = \$225,018$



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on Test Req... Program: Software... sa- Graduate Admission... Discord CS 442: Mobile App... Discord | #cs442 |... Why Flutter Uses Da... » ⋮

Home / Optical Transceivers / DAC/AOC/AEC Cables / 100G DAC/AOC / 50482

3m (10ft) Cisco QSFP-100G-CU3M Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable #50482

≤0.5W | 46mm | 30AWG | Twinax

US\$54.00
FS P/N: Q28-PC03 11.5K Sold | 57 Reviews | 11 Questions

Racks:

Each compute server is of size 4U. There are 4000 compute servers.

Each storage server is of size 4U. There are 150 storage servers.

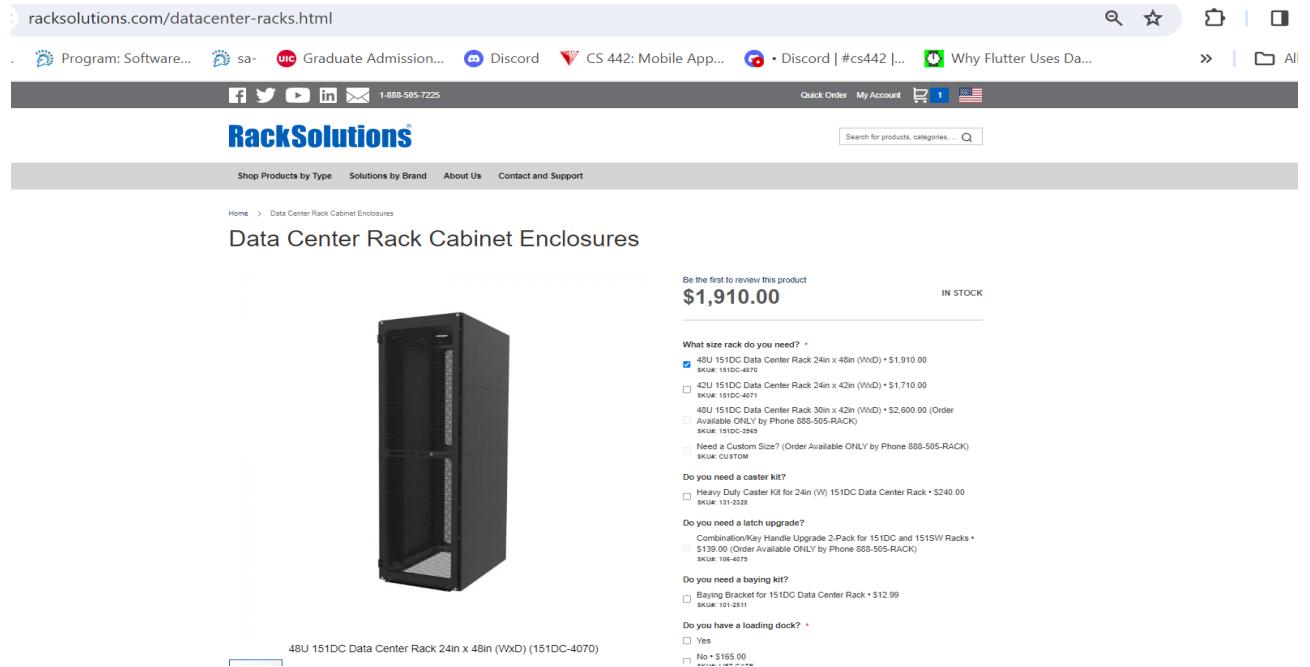
1 48U rack can fit 12 machines of 4U size.

No of racks required to fit all the machines= 346

Each rack cabinet costs \$1910

Total cost for the racks= $1910 \times 346 = \$660,860$

48U 151DC Data Center Rack 24in x 48in (WxD) : \$1,910.00



Be the first to review this product
\$1,910.00 IN STOCK

What size rack do you need? *

48U 151DC Data Center Rack 24in x 48in (WxD) • \$1,910.00
SKU: 151DC-4070

42U 151DC Data Center Rack 24in x 42in (WxD) • \$1,710.00
SKU: 151DC-4071

48U 151DC Data Center Rack 30in x 42in (WxD) • \$2,800.00 (Order Available ONLY by Phone 888-505-RACK)
SKU: 151DC-3565

Need a Custom Size? (Order Available ONLY by Phone 888-505-RACK)
SKU: CUSTOM

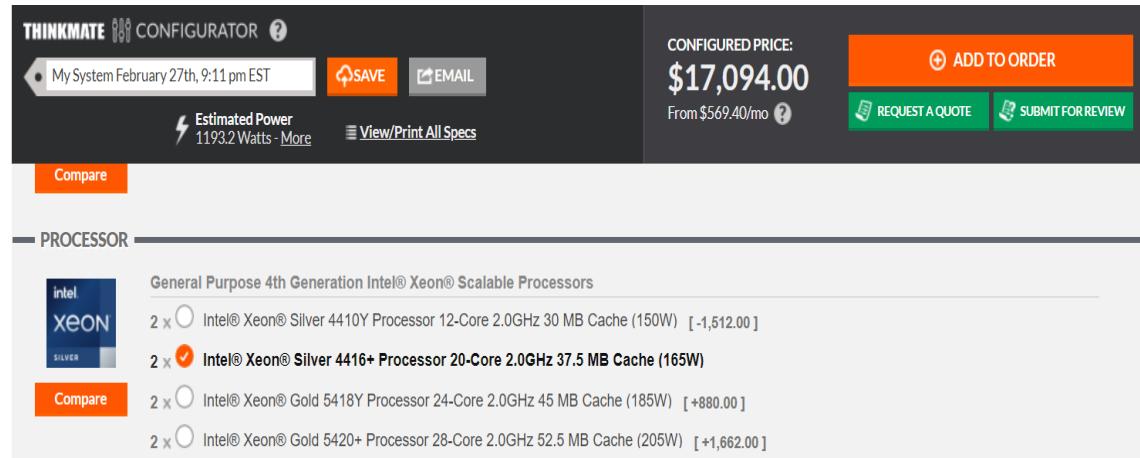
Do you need a caster kit?
 Heavy Duty Caster Kit for 24in (W) 151DC Data Center Rack • \$240.00
SKU: 151-2538

Do you need a latch upgrade?
 Combination Key Handle Upgrade 2-Pack for 151DC and 151SW Racks • \$139.00 (Order Available ONLY by Phone 888-505-RACK)
SKU: 154-4075

Do you need a baying kit?
 Baying Bracket for 151DC Data Center Rack • \$12.99
SKU: 151-2511

Do you have a loading dock?
 Yes
 No • \$165.00

Electricity Cost Calculation:



CONFIGURED PRICE:
\$17,094.00
From \$569.40/mo

ADD TO ORDER

REQUEST A QUOTE

SUBMIT FOR REVIEW

PROCESSOR

General Purpose 4th Generation Intel® Xeon® Scalable Processors

2 x Intel® Xeon® Silver 4410Y Processor 12-Core 2.0GHz 30 MB Cache (150W) [-1,512.00]

2 x Intel® Xeon® Silver 4416+ Processor 20-Core 2.0GHz 37.5 MB Cache (165W)

2 x Intel® Xeon® Gold 5418Y Processor 24-Core 2.0GHz 45 MB Cache (185W) [+880.00]

2 x Intel® Xeon® Gold 5420+ Processor 28-Core 2.0GHz 52.5 MB Cache (205W) [+1,662.00]

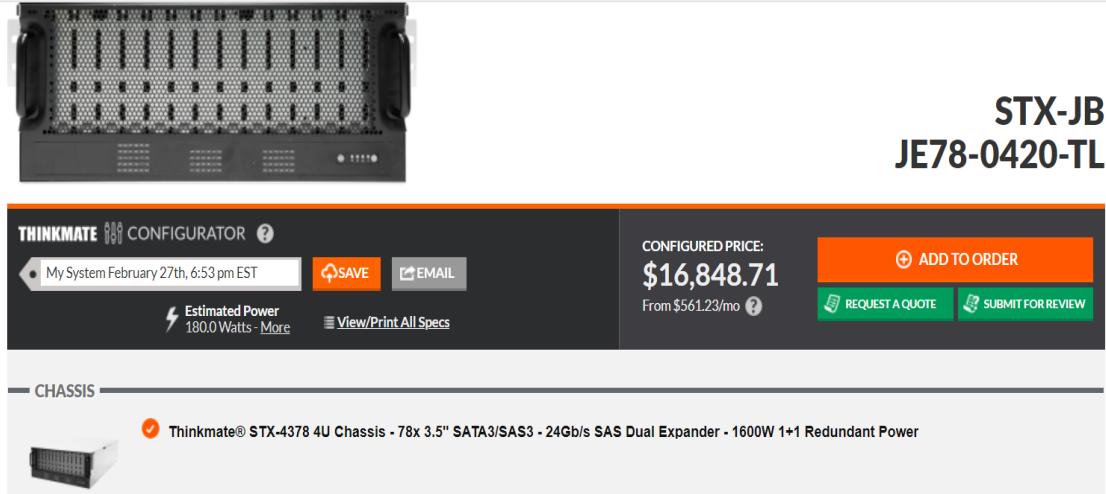
1 compute server consumes 1193.2 Watts/hr.

4000 compute servers consume $4000 \times 1193.2 = 4,772,800$ Watts/hr = 4772.8 kWh

Assuming electricity rate = 10 cents per kilowatt-hour = \$0.10 kWh

Cost of electricity per hour = $4772.8 \times 0.10 = \$477.28$

Total power consumption for compute server 5 years = \$20,904,864



STX-JB
JE78-0420-TL

THINKMATE CONFIGURATOR

My System February 27th, 6:53 pm EST

SAVE EMAIL

Estimated Power 180.0 Watts - More

View/Print All Specs

CONFIGURED PRICE: \$16,848.71

From \$561.23/mo

ADD TO ORDER

REQUEST A QUOTE

SUBMIT FOR REVIEW

CHASSIS

Thinkmate® STX-4378 4U Chassis - 78x 3.5" SATA3/SAS3 - 24Gb/s SAS Dual Expander - 1600W 1+1 Redundant Power

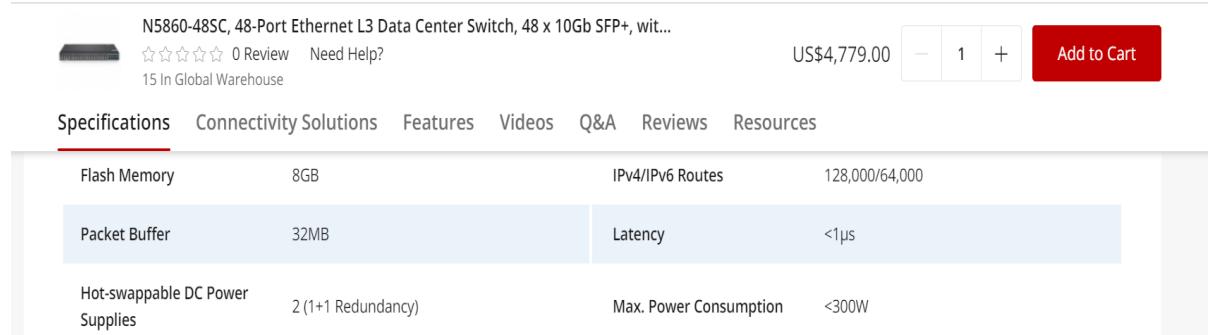
1 storage server consumes 180 Watts/hr.

150 compute servers consume $150 \times 180 = 27,000$ Watts/hr = 27 kWh

Assuming electricity rate = 10 cents per kilowatt-hour = \$0.10 kWh

Cost of electricity per hour = $27 \times 0.10 = \$2.7$

Total power consumption for 5 years for storage server = \$118,260



N5860-48SC, 48-Port Ethernet L3 Data Center Switch, 48 x 10Gb SFP+, wit...

0 Review Need Help?

15 In Global Warehouse

US\$4,779.00

Add to Cart

Specifications	Connectivity Solutions	Features	Videos	Q&A	Reviews	Resources
Flash Memory	8GB			IPv4/IPv6 Routes	128,000/64,000	
Packet Buffer	32MB			Latency	<1μs	
Hot-swappable DC Power Supplies	2 (1+1 Redundancy)			Max. Power Consumption	<300W	

Each switch can consume power up to 300W.

Total 84 switches consume 25,200W power = 25.2kWh

Assuming electricity rate = 10 cents per kilowatt-hour = \$0.10 kWh

Cost of electricity per hour = $25.2 \times 0.10 = \$2.52$

Total power consumption for 5 years network switch = \$110,376

Total cost for electricity is the sum of the cost of power consumed by compute server, storage server and network switch.

Total electricity cost= 20,904,864 + 118,260 + 110,376 = \$21,133,500

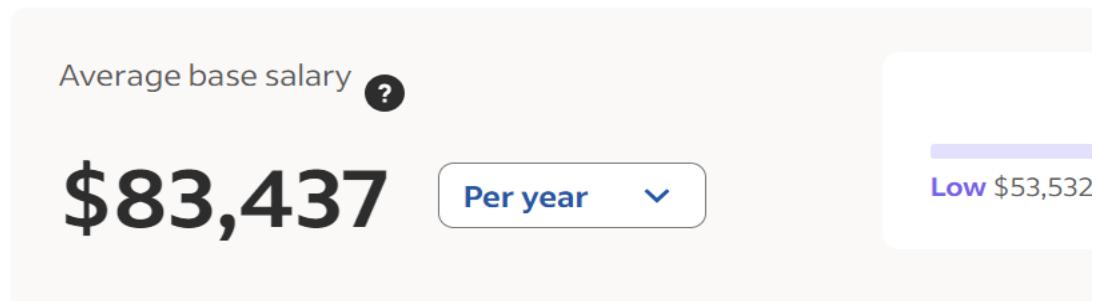
Administration:

Reference: <https://www.indeed.com/career/systems-administrator/salaries>

Home > Career Explorer > Systems Administrator > Salaries

Systems administrator salary in United States

How much does a Systems Administrator make in the United States?



Assuming 1 system administrator for 500 servers. We require 8 administrators for 5 years.

Total administration cost = \$3,337,480

Configuration 2:

Public Cloud for configuration 2: AWS

Amazon EC2:

AWS instance considered here is mac1.metal.

Amazon EC2 Overview Features Pricing Instance Types ▾ FAQs Getting Started Resources ▾

Product details

x86-based EC2 Mac instances EC2 M1 Mac instances EC2 M2 Mac instances EC2 M2 Pro Mac instances

x86-based EC2 Mac instances are powered by a combination of Mac mini computers, which feature Intel's eighth-generation 3.2 GHz (4.6 GHz turbo) Core i7 processors, 6 physical and 12 logical cores, and 32 GiB of memory; and the AWS Nitro System, which provides up to 10 Gbps of Amazon VPC network bandwidth and 8 Gbps of Amazon EBS storage bandwidth through high-speed Thunderbolt 3 connections. x86-based EC2 Mac instances are uniquely enabled by the AWS Nitro System, which makes it possible to offer Mac mini computers as fully integrated and managed compute instances with Amazon VPC networking and Amazon EBS storage, just like any other Amazon EC2 instance. EC2 Mac instances are available in bare-metal instance size (mac1.metal) and support macOS Mojave (10.14), macOS Catalina (10.15), macOS Big Sur (11), and macOS Monterey (12) as AMIs.

Instance family	Instance size	Processor	Physical cores	vCPUs	Memory (GiB)	Instance storage	Network bandwidth (Gbps)	EBS bandwidth (Gbps)
Mac1	mac1.metal	Intel Core i7	6	12	32	EBS-Only	10	8

Reference for pricing: <https://instances.vantage.sh/aws/ec2/mac1.metal>

← → ⌂ instances.vantage.sh/aws/ec2/mac1.metal

Admission Test Req... Program: Software... sa- Graduate Admission... Discord CS 442: Mobile App... Discord | #cs442 |... 🔍

Vantage

Optimize Kubernetes Costs with pod efficiency reports →

mac1.metal

The mac1.metal instance is in the general purpose family with 12 vCPUs, 32.0 GiB of memory and 25 Gibps of bandwidth starting at \$1.083 per hour.

">\$1.083 Pricing

\$1.083	N/A	N/A	N/A
On Demand	Spot	1 Yr Reserved	3 Yr Reserved

US East (N. Virginia) Dedicated Host

Per Hour No Upfront

Family Sizes

Size	vCPUs	Memory (GiB)
mac1.metal	12	32

Instance Details

Compute	Value
vCPUs	12
Memory (GiB)	32.0
Memory per vCPU (GiB)	2.67
Physical Processor	Intel Core i7-8700B CPU
Clock Speed (GHz)	3.2
CPU Architecture	x86_64_mac
GPU	0
GPU Architecture	none
Video Memory (GiB)	0
GPU Compute Capability (?)	0
FPGA	0

Mac1.metal instance on demand pricing is \$1.083 per hour.

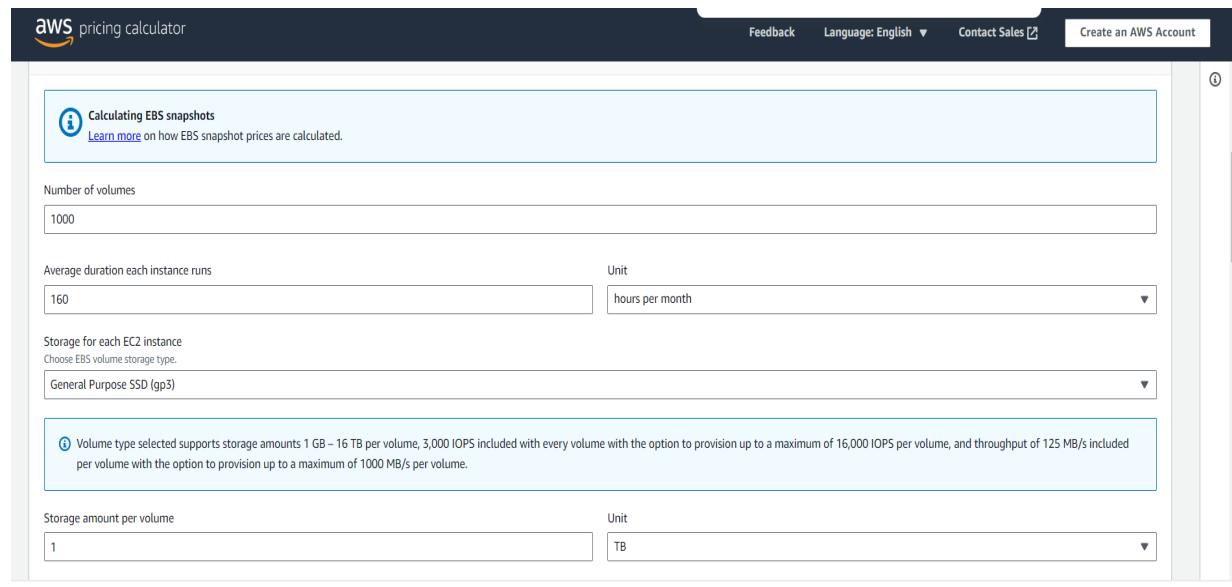
For 1 instance, for 40 hours a week for 1 developer: $40 * 1.083 = \$43.32$

For 1 instance, for 48 weeks in a year for 1 developer: $\$2079.36$

For 1K instances for a year 1k developers = $\$2,079,360$

For 1k instances for 5 years for 1k developers = \$10,396,800

Storage EBS:



The screenshot shows the AWS Pricing Calculator interface for estimating EBS storage costs. The configuration includes 1000 volumes, an average duration of 160 hours per month, and General Purpose SSD (gp3) storage for each EC2 instance. The estimated total monthly cost is \$30,160.76 USD. The screenshot also shows the 'My Estimate' page, which displays the total 12-month cost as \$361,929.12 USD, including the upfront cost.

My Estimate

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	30,160.76 USD	361,929.12 USD Includes upfront cost

For 1 month amazon EBS storage cost is \$30,160.76

For 1 year, amazon EBS storage cost is \$361,929.12

For 5 years, amazon EBS storage cost is \$1,809,645.6

Total cost for public cloud for configuration 2 is the sum of amazon EC2 instance price and the EBS storage: \$10,396,800+\$1,809,645.6 = \$12,206,445.6

Cost for public cloud AWS for configuration 1 for 5 years: \$12,206,445.60

Private Cloud for configuration 2:

Mac mini with 6-cores (3GHz), 32GB RAM, 1TB storage, and 10Gb/s network is not available on apple website. Hence choosing an alternative mac mini M2 pro with 10 core CPU, 32GB RAM, 1TB SSD storage and 10Gb/s network.

	Description	Price Per Item	Quantity	Total Price
Compute Servers	Mac Mini Apple M2 Pro with 10- core CPU, 16-core GPU, 16- core Neural Engine	\$2123.94	1000	\$2,123,940
Network Switches	NETGEAR - 24- Port 10/100/1000 Mbps Gigabit Unmanaged Switch - Blue	\$129.99	42	\$5459.58
Network Cables	USB C to Ethernet Cable 6FT, Type C to RJ45 Cord, Directly Connected, Gigabit LAN Network, Thunderbolt 3/4 Compatible	\$20.98	1168	\$24,504.64
Racks	5U HyperShelf for 16 Apple Mac Mini	\$599.99	63	\$37,799.37
Storage Servers	-	-	-	-
Electric Power	Power consumed by compute and storage servers	\$0.1256	Refer Electricity Cost Calculation below	\$150,626
Cooling	Assuming cooling cost is same as the amount of cost occurred for power consumption	-	-	\$150,626
Administration	Salary for system administrator	\$83,437	2	\$834,370
TOTAL	-			\$3,327,324.95

Each device costs \$2123.94

There are 1K application developers who are designing MacOS and iPad OS applications.

Cost for 1K mac mini: \$2,123,940

Network Switches:

For 1k mac minis, the number of 24 port switches required are 42. Each switch costs \$129.99

Price of network switches: \$5459.58

The screenshot shows the Best Buy website for a NETGEAR 24-Port 10/100/1000 Mbps Gigabit Unmanaged Switch (Blue). The product image is a blue rectangular device with multiple ports. The price is listed as \$129.99, with a savings of \$30.00. Availability options include Pickup (Ready on Tue, Mar 5) and Shipping (Get it by Mon, Mar 4). The page also includes a 'Customer Images' section with five small thumbnail images.

Network Cable:

As per fat tree network, 1k mac min with 42 switches of 24 ports each requires a total of 1168 cables. Assuming each mac mini connects to an edge switch, which requires 1000 cables. Each edge switches connect to 2 aggregate switches, will require 84 cables. Each aggregate switch connects to 2 core switches, which requires 84 cables.

Cost of 1 cable is \$20.98.

Cost for 1168 cables: $1168 \times 20.98 = 24,504.64$

Total cost for cables: \$24,504.64

The screenshot shows the Amazon product page for an Ethernet Cable with Assorted Colors, Lengths. The product image is a black braided cable with multiple RJ45 connectors. The price is listed as \$139.99. A Prime delivery offer is highlighted, stating "Enjoy fast, free delivery, exclusive deals, and award-winning movies & TV shows with Prime". The page also includes a "Delivery" and "Pickup" section, and a "FREE delivery Monday, March 4" offer for orders over \$35.

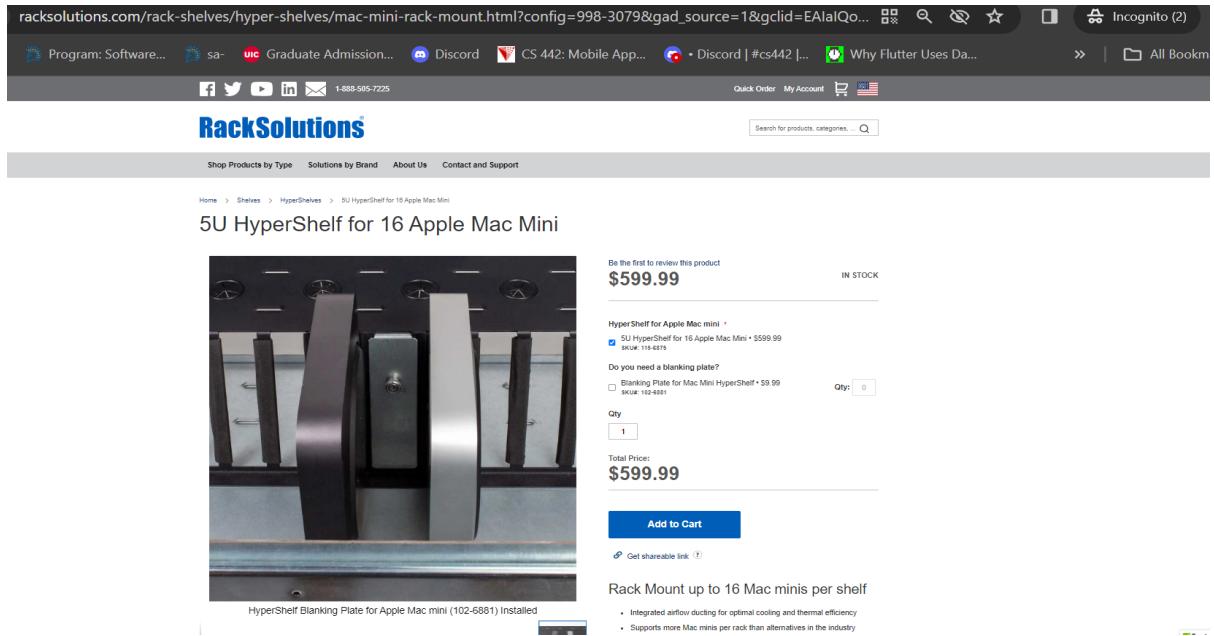
Racks:

Each rack fits 16 mac mini.

To fit 1k mac mini, we require 63 racks.

Each rack costs \$599.99.

Total cost for racks: \$37,799.37



The screenshot shows a product page for the "5U HyperShelf for 16 Apple Mac Mini" on the RackSolutions website. The page includes a product image showing the shelf installed in a rack, a price of \$599.99, and a summary of its features, such as integrated airflow ducting and support for up to 16 Mac minis per shelf.

Electric Power Cost:

Reference for power consumption: <https://support.apple.com/en-us/103253>

Maximum power consumption for mac mini M2 pro for each mac mini: 100W

Running 1 mac mini for 40 hours/week for 1 developer would consume: $4,000\text{Wh} = 4\text{kWh}$

Running 1 mac mini 48 weeks per year for 1 developer would consume: 192kWh

For 1k developers, running 1k mac mini for 1 year power consumption: 192,000kWh

Reference for latest 2024 electricity cost: <https://www.electricchoice.com/electricity-prices-by-state/>

For IL state, cost for 1 unit of power: $12.56\text{¢} / \text{kWh} = \0.1256

Electricity cost to run 1k machines for a **single year**: $192,000\text{kWh} * \$0.1256$

: **\$24,115.2**

For **5 years**, the cost of running 1k machines for 1k developers: $5 * 24,115.2: \$120,576$

Each year CPU will remain idle for 4 weeks and also the remaining hours after running the machines during the 48 weeks in a year. During this time mac mini will be idle.

Each system will be idle for 6,840 hours in a year.

The power consumption for idle state for mac mini is 7W per hour for each machine.

The amount of power consumed by each system in 1 year during idle time: $6840 * 7$

: 47,880Wh

: 47.88kWh

Cost of electricity for 1 machine for 1 year: $47.88 * 0.1256 = \$6.01$

Cost of electricity for 1K machines for 1 year during idle time: $\$6,010$

Cost of electricity for 1K machines for 5 years during idle time: **$\$30,050$**

Total cost of electricity for 5 years: cost of running 1k machines plus cost of power consumed by 1k machines during idle time= $\$120,576 + \$30,050$

Total cost of electricity for 5 years for mac mini private cloud: $\$150,626$

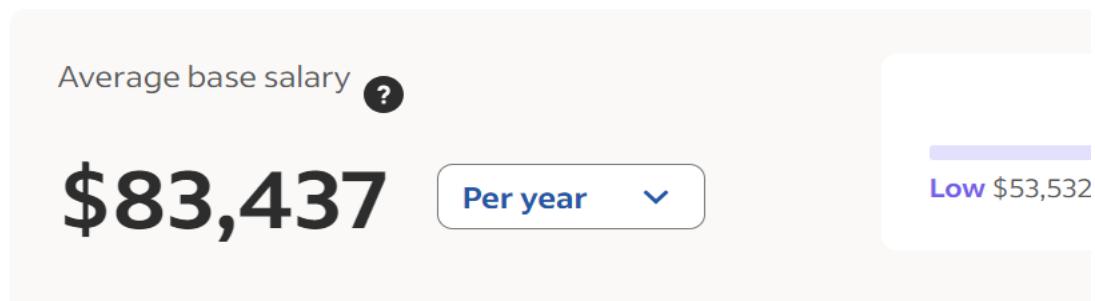
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Home > Career Explorer > Systems Administrator > Salaries

Systems administrator salary in United States

How much does a Systems Administrator make in the United States?



Assuming 1 system administrator for 500 machines. We require 2 administrators for 5 years.

Total administration cost = \$834,370

Configuration 3:

Public Cloud for configuration 3:

Amazon EC2 configuration:

AWS Pricing Calculator > My Estimate > Edit Amazon EC2

Edit Amazon EC2 [Info](#)

Description

Choose a location type [Info](#)

Choose a Region

EC2 specifications [Info](#)

Tenancy
Choose the tenancy type to run your Amazon EC2 instances on.
 Shared Instances

Operating system
Choose the operating system to run your Amazon EC2 instances on.
 Linux

Total Upfront cost: 0.00 USD
Total Monthly cost: 143,762.11 USD [Show Details](#) [Update](#)

Workload
Choose the graph that best represents your monthly workload
 Constant usage Daily spike traffic Weekly spike traffic Monthly spike traffic

Number of instances
Please specify the total number of Instances that you need each month.

EC2 Instances (695)
Based on your inputs, this is the lowest-cost EC2 instance: **t4g.nano**
Chosen instance: **g4dn.xlarge** | Family: **g4dn** | 4vCPU | 16 GiB Memory

Search instance type

Instance family [Info](#)
 vCPUs Memory (GiB) Network performance

Show only current generation instances.

[Show Details](#) [Update](#)

aws pricing calculator [Feedback](#) [Language: English](#) [Contact Sales](#) [Create an AWS Account](#)

Payment options

Estimated commitment price based on the following selections:
Instance type: **g4dn.xlarge** Operating system: **Linux**

Select the container and options to find your best price

Compute Savings Plans
One plan that automatically applies to all usage on EC2, Fargate, and Lambda. Up to 66% discount. [Learn more](#)

Reservation term
 1 year 3 year

Payment Options
 No upfront Partial upfront All upfront

Upfront: 0.00 [Show Details](#) [Update](#)

EC2 Instance Savings Plans
Get deeper discount when you only need one instance family and region. Up to 72% discount. [Learn more](#)

Reservation term
 1 year 3 year

Payment Options
 No upfront Partial upfront All upfront

Upfront: 0.00 [Show Details](#) [Update](#)

On-Demand
Maximize flexibility. [Learn more](#)

Expected utilization
Enter the expected usage of Amazon EC2 instances

Usage

Usage type

Instance: 0.526/Hour [Show Details](#) [Update](#)

Spot Instances
Minimize cost by leveraging EC2's spare capacity. Recommended for fault tolerant and interruption tolerant applications. [Learn more](#)

The historical average discount for g4dn.xlarge is 61%

Assume percentage discount for my estimate

Actual spot instance pricing varies
With spot instances, you pay the spot price that's in effect for the time period your instance is running

Instance: 0.526/Hour [Show Details](#) [Update](#)

Total Upfront cost: 0.00 USD
Total Monthly cost: 143,762.11 USD [Show Details](#) [Update](#)

Monthly: 199.29/Month Monthly: 165.71/Month Monthly: 383.98/Month Monthly: 143762.11/Month

► Other purchasing options

► Show calculations

► Amazon Elastic Block Store (EBS) - *optional* [Info](#)

► Detailed monitoring - *optional* [Info](#)

► Data transfer - *optional*

► Additional costs - *optional*

Total Upfront cost: 0.00 USD Total Monthly cost: 143,762.11 USD Show Details [▼](#) Cancel Update

AWS Pricing Calculator > My Estimate

My Estimate [Edit](#)

Estimate summary [Info](#)

Upfront cost: 0.00 USD Monthly cost: 143,762.11 USD Total 12 months cost: 1,725,145.32 USD (Includes upfront cost)

Getting Started with AWS

Get started for free Contact Sales

My Estimate

Find resources

Service Name: Amazon EC2 Status: - Upfront cost: 0.00 USD Monthly cost: 143,762.11 USD Description: - Region: US East (Ohio) Config Summary: Tenancy (Shared Instance)...

Duplicate Delete Move to Create group Add support Add service

Amazon instance spot prices: g4dn.xlarge

aws.amazon.com/ec2/spot/pricing/

Program: Software... Graduate Admissions... Discord CS 442: Mobile App... Discord | #cs442 |... Why Flutter Uses Da... All Bookmarks

Pricing page

Select a location type and region

Location Type: AWS Region Region: US East (Ohio)

Instance Family: All

Q: g4dn.x 1 match

Instance Type	Linux/UNIX Usage	Windows Usage	Instance Family
g4dn.xlarge	\$0.206	\$0.2367	GPU Instances - Current Generation

Cluster GPU Instances are not available in all regions.

Product Details

	Instance Size	GPU	vCPUs	Memory (GiB)	Instance Storage (GB)	Network Bandwidth (Gbps)	EBS Bandwidth (Gbps)	On-Demand Price/hr*	1-yr Reserved Instance Effective Hourly* (Linux)	3-yr Reserved Instance Effective Hourly* (Linux)
G4dn										
	g4dn.xlarge	1	4	16	1 x 125 NVMe SSD	Up to 25	Up to 3.5	\$0.526	\$0.316	\$0.210

This instance has 1 NVIDIA GPU and 960 instances are configured to match the hardware configured for private cloud.

Per month: \$143,762.11

Cost for 1 year: \$1,725,145.32

Cost for 5 years: \$8,625,726.6

Total EC2 instances cost= \$8,625,726.6

Public cloud cost for configuration3: \$8,625,726.6

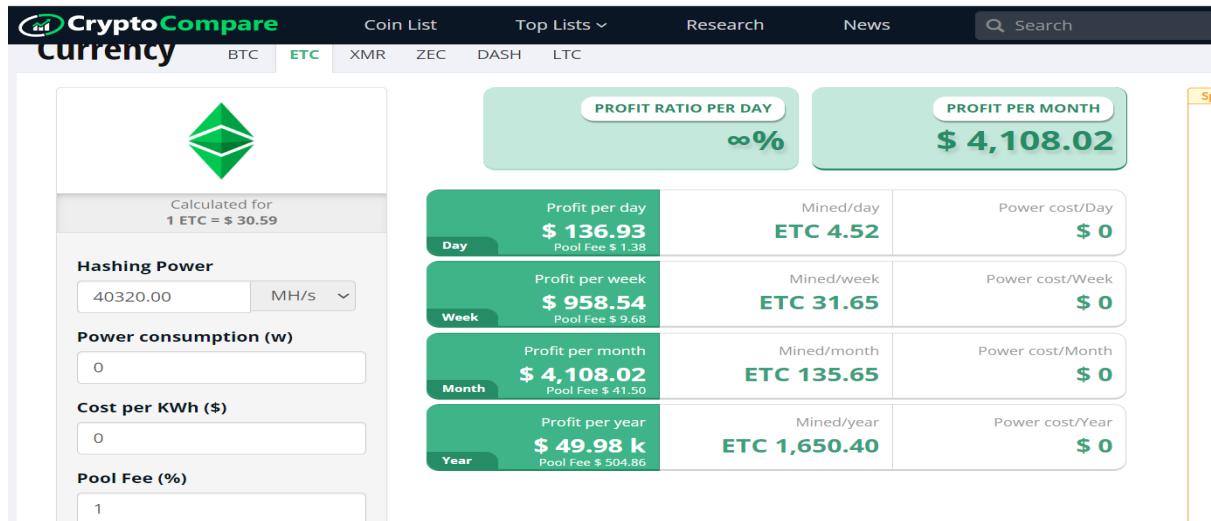
\$8,625,726.6 is invested in renting the cloud for 5 years.

There are 960 instances with 1 GPU each. So, we have 960 GPU.

The hash rate as per KawPow is 40320.00 Mh/s.

Power consumption is not considered as its public cloud.

Ethereum Profit for public cloud:



Per month profit: \$4108.02

For 1 year profit: \$49,298

For 5 years profit: \$246,492

Ravencoin Profit for public cloud:

Hashrate	Power consumption	Pool fee	Currency	Electricity costs	
40320	MH/s	0 W	1 %	USD	Calculate
PERIOD	EST. REWARD	EST. INCOME	COSTS	EST. PROFIT	
Last 1h	1199.88 RVN	31.1409 USD 0.000050729 BTC	-0.00 USD -0.00000000 BTC	31.1409 USD 0.000050729 BTC	
Last 24h	30196.80 RVN	781.9953 USD 0.01273870 BTC	-0.00 USD -0.00000000 BTC	781.9953 USD 0.01273870 BTC	
Last 7 days	208964.23 RVN	5103.0844 USD 0.08312924 BTC	-0.00 USD -0.00000000 BTC	5103.0844 USD 0.08312924 BTC	
Current daily	29562.09 RVN	766.3452 USD 0.01248376 BTC	-0.00 USD -0.00000000 BTC	766.3452 USD 0.01248376 BTC	
Current for 7 days	206934.60 RVN	5364.4164 USD 0.08738634 BTC	-0.00 USD -0.00000000 BTC	5364.4164 USD 0.08738634 BTC	
Current for 30 days	886862.55 RVN	22990.3561 USD 0.37451290 BTC	-0.00 USD -0.00000000 BTC	22990.3561 USD 0.37451290 BTC	

Per month profit: \$22,990.3561

Assuming profit is same each month,

For 1 year profit: \$275,884.2732

For 5 years profit: \$1,379,421.366

Private Cloud for configuration 3:

	Description	Price Per Item	Quantity	Total Price
Compute Servers	GPX XN6-24S3-10GPU Intel® C621A Chipset - 4U GPU Server - 24x 2.5" Hot-swap - Dual 1-Gigabit Ethernet - 2000W (3+1) Redundant 2 x Intel® Xeon® Silver 4310 Processor 12-Core 2.1GHz 18MB Cache (120W) 16 x 16GB PC4-25600 3200MHz DDR4 ECC RDIMM 2 x No DC Persistent Memory Currently Selected 240GB Micron 5400 PRO Series 2.5" SATA 6.0Gb/s Solid State Drive 10 x NVIDIA® RTX A5000 - 24GB GDDR6 - PCIe 4.0 x16 - Active Cooling (4xDP) Broadcom NetXtreme 1-Gigabit Ethernet Network Adapter - PCIe 2.0 x1 - 2x RJ45	\$37,958.10	160	\$6,073,296.00
Network Switches	N5860-48SC 48-Port Ethernet L3 Data Center Switch, 48 x 10Gb SFP+, with 8 x 100Gb QSFP28, Support MLAG/Stacking, Broadcom Chip, Dual DC PSUs, Support RoCE	\$4,779	4	\$19,116
Network Cables	3m (10ft) Cisco QSFP-100G-CU3M Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	\$54	168	\$9,072
Racks	48U 151DC Data Center Rack 24in x 48in (WxD)	\$1910	14	\$26,740
Storage Servers	-	-	-	-
Electric Power	Power consumed by compute and storage servers	\$0.07	Refer Electricity Cost Calculation below	\$1,334,323.2
Cooling	Assuming cooling cost is same as the amount of cost occurred for power consumption	-	-	\$1,334,323.2
Administration	Salary for system administrator	\$83,437	1	\$417,185
TOTAL				\$9,214,055.4

1 compute server costs \$37,958.10

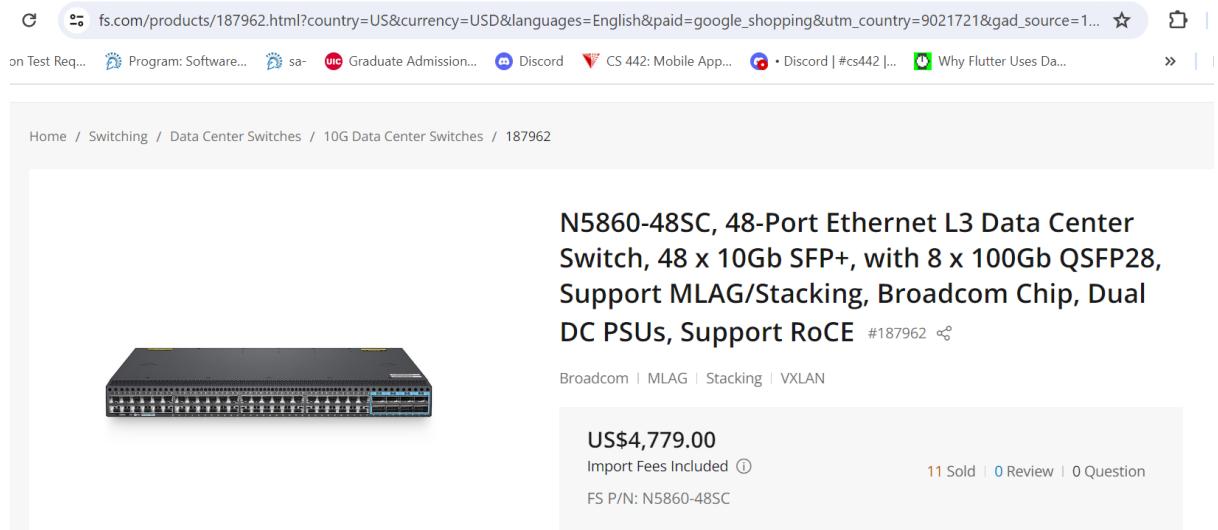
160 compute servers cost **\$6,073,296.00**

Network Switches:

Number of switches required to connect servers = $160/48 \approx 4$

Cost of 1 48 port switch is \$4,779

Total cost for network switch = $4779 \times 4 = \$19,116$



Home / Switching / Data Center Switches / 10G Data Center Switches / 187962

N5860-48SC, 48-Port Ethernet L3 Data Center Switch, 48 x 10Gb SFP+, with 8 x 100Gb QSFP28, Support MLAG/Stacking, Broadcom Chip, Dual DC PSUs, Support RoCE #187962

Broadcom | MLAG | Stacking | VXLAN

US\$4,779.00
Import Fees Included ⓘ
11 Sold | 0 Review | 0 Question
FS P/N: N5860-48SC

Network Cables:

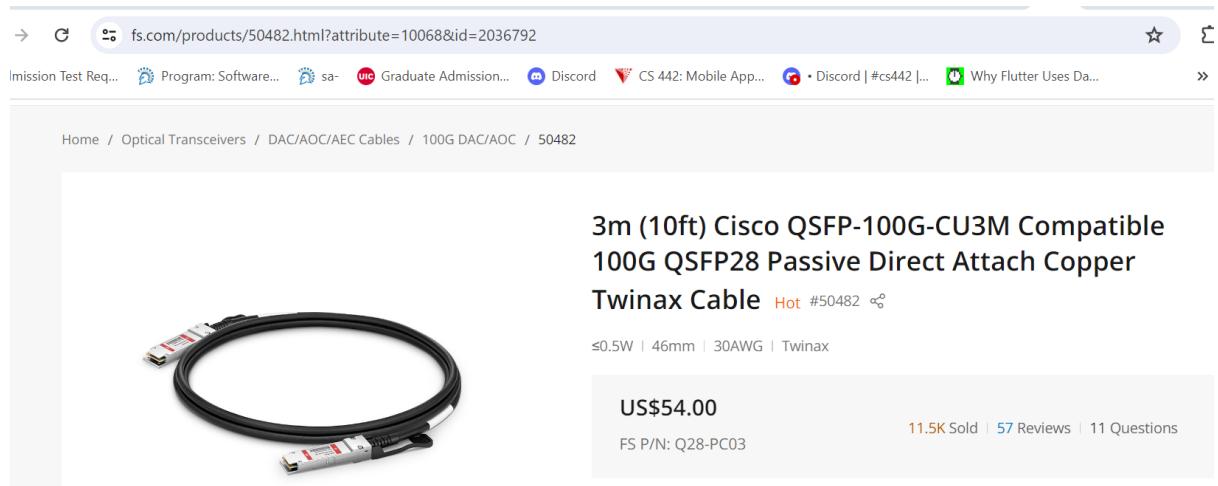
Each network cable cost \$54.

As per the fat tree network design, the network cables required are as follow.

160 servers require 160 cables.

As there are 4 switches with 48 ports each, 4 network cables are required to connect all the switches. 4 cables required to connect switches to servers.

Total 168 cables cost = $168 \times 54 = \$9,072$



Home / Optical Transceivers / DAC/AOC/AEC Cables / 100G DAC/AOC / 50482

3m (10ft) Cisco QSFP-100G-CU3M Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable #50482

≤0.5W | 46mm | 30AWG | Twinax

US\$54.00
Import Fees Included ⓘ
11.5K Sold | 57 Reviews | 11 Questions
FS P/N: Q28-PC03

Racks:

Each compute server is of size 4U. There are 160 compute servers.

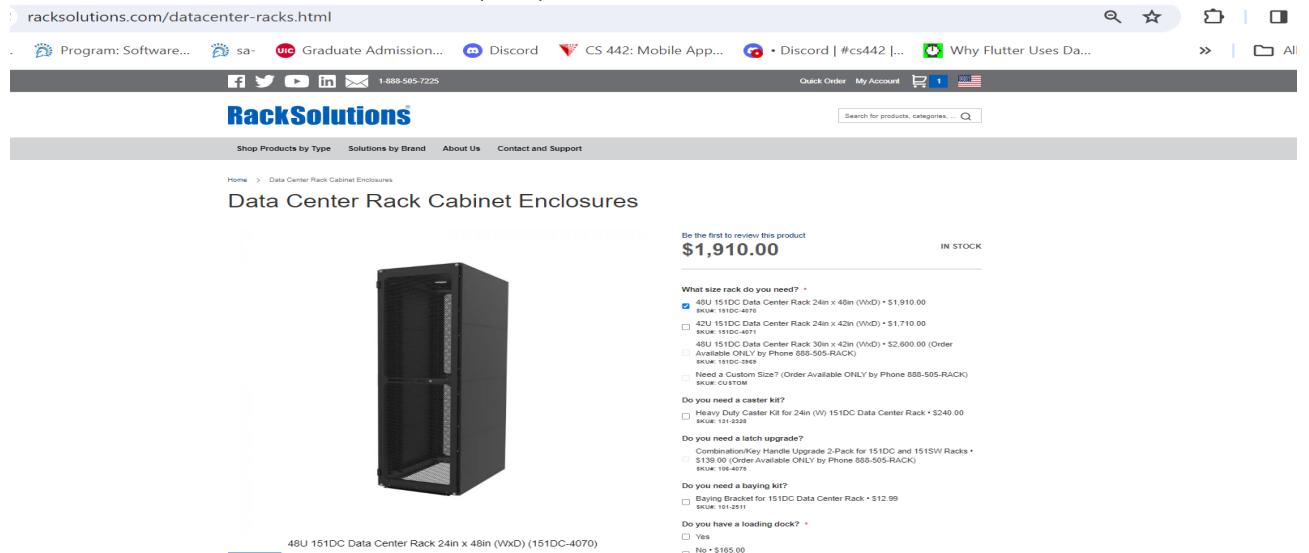
1 48U rack can fit 12 machines of 4U size.

No of racks required to fit all the machines= 14

Each rack cabinet costs \$1910

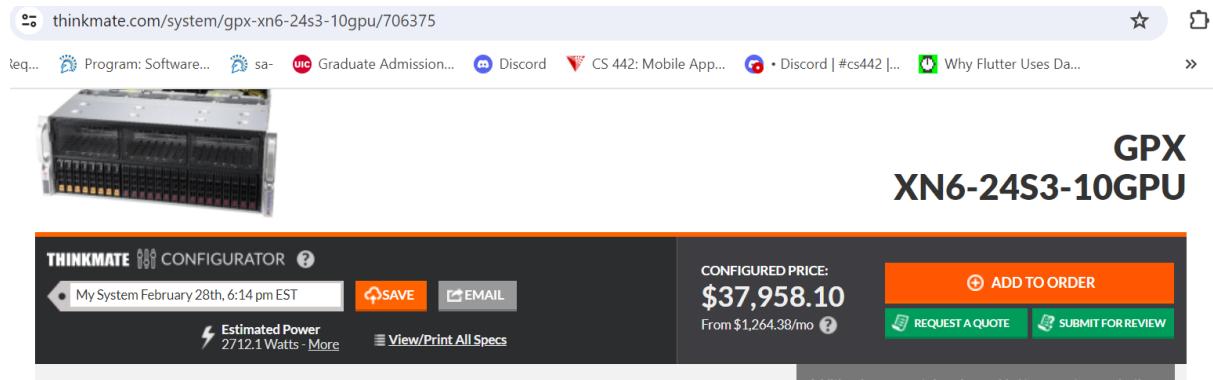
Total cost for the racks= $1910 \times 14 = \$26,740$

48U 151DC Data Center Rack 24in x 48in (WxD) : \$1,910.00



Electric Power Cost:

For business, electricity cost is 7.33 cents/kWh(\$0.07) in North Dakota.



1 compute server consumes 2712.1 Watts/hr. This includes the power consumed by GPU.

160 compute servers consume $160 \times 2712.1 = 433,936$ Watts/hr = 433.936 kWh

North Dakota electricity rate = \$0.07 per kilowatt-hour

Cost of electricity per hour = $433.936 \times 0.07 = \$30.38$

Power consumption cost for all compute server 5 years = \$1,330,644

Each switch can consume power up to 300W.

Total 4 switches consume 1200W power = 1.2kWh

North Dakota electricity rate = \$0.07 per kilowatt-hour

Cost of electricity per hour = $1.2 \times 0.07 = \$0.084$

Power consumption for 5 years for all network switch = \$3,679.2

Total power consumption cost for 5 year = \$1,334,323.2

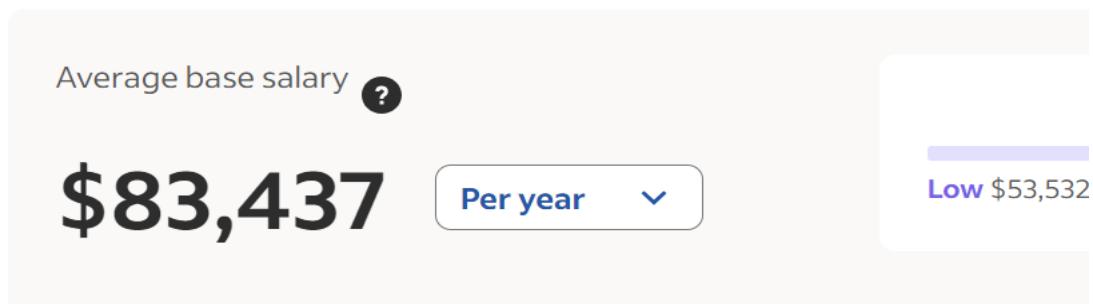
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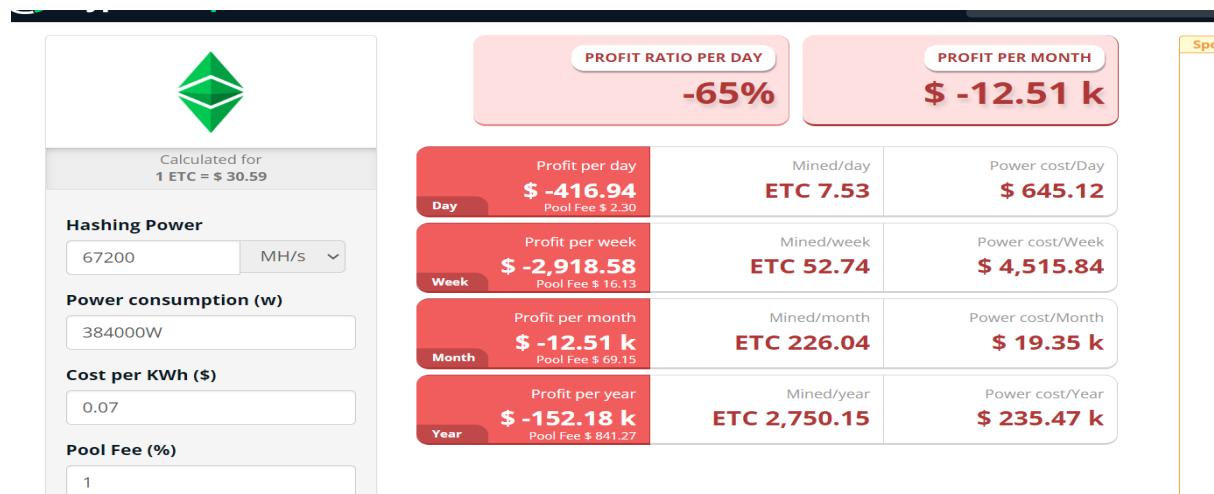
Total administration cost = \$417,185

We have 160 servers with 10 GPU each. Overall, there are 1600 GPU.

The hash rate as per KawPow is 67200.00 Mh/s.

Power consumption is 384000W

Ethereum Profit for private cloud:



Per month profit: \$-12,510

For 1 year profit: \$-150,120

For 5 years profit: \$-750,600

Ravencoin Profit for public cloud:

PERIOD	EST. REWARD	EST. INCOME	COSTS	EST. PROFIT
Last 1h	1999.80 RVN	51.9015 USD 0.00084548 BTC	-26.88 USD -0.00043788 BTC	25.0215 USD 0.00040760 BTC
Last 24h	50328.01 RVN	1303.3255 USD 0.02123117 BTC	-645.12 USD -0.01050900 BTC	658.2055 USD 0.01072217 BTC
Last 7 days	348273.72 RVN	8505.1406 USD 0.13854874 BTC	-4515.84 USD -0.07356303 BTC	3989.3006 USD 0.06498571 BTC
Current daily	49270.14 RVN	1277.2420 USD 0.02080627 BTC	-645.12 USD -0.01050900 BTC	632.1220 USD 0.01029727 BTC
Current for 7 days	344890.99 RVN	8940.6940 USD 0.14564391 BTC	-4515.84 USD -0.07356303 BTC	4424.8540 USD 0.07208087 BTC
Current for 30 days	1478104.26 RVN	38317.2602 USD 0.62418817 BTC	-19353.60 USD -0.31527014 BTC	18963.6602 USD 0.30891802 BTC

Per month profit: \$18,963.6602

Assuming profit is same each month,

For 1 year profit: \$227,563.9224

For 5 years profit: \$1,137,819.612

=====

Explain in words if it is better to rent or buy, and by how much.

	Configuration 1	Configuration 2
Public Cloud (including EC2 and S3) Cost over 5 years	\$734,046,660.00	\$12,206,445.60
Private Cloud cost over 5 years	\$117,795,100.5	\$3,327,324.95

For configuration1, for 5 years of time, it is beneficial to purchase the hardware and configure the private cloud than the AWS public cloud. Renting AWS public cloud costs **6.2** times more than the private cloud. So public cloud option is not economic for this configuration.

For configuration2, renting public cloud costs 3.7 times more than purchasing private cloud. In terms of performance and return on investment, private cloud is a beneficial option. Additionally, the hardware can be used beyond 5 years which would not be possible renting public cloud. Private cloud is economical for this configuration.

	Configuration 3
Public Cloud Mining Profit over 5 years	Etherum: \$246,492 , RavenCoin: \$1,379,421.366
Private Cloud Mining Profit over 5 years	Etherum: -\$750,600 , RavenCoin: \$1,137,819.612

Note: For configuration 3 above are the profits without considering the investment for public or private cloud.

The cost to rent public cloud for 5 years: **\$8,625,726.6**

The cost of buying private cloud and maintaining for 5 years: **\$9,214,055.4**

Public cloud:

The profit made by **Ethereum** for 5 years (\$246,492) is nowhere close to the amount invested in renting the public cloud. It is a **loss** of **\$8,379,234.6** to the investor.

Similarly for raven coin, the profit made in 5 years (\$1,379,421.366) did not cover the amount invested for renting the public cloud. It is a **loss** of **\$7,246,305.234** to the investor.

Private cloud:

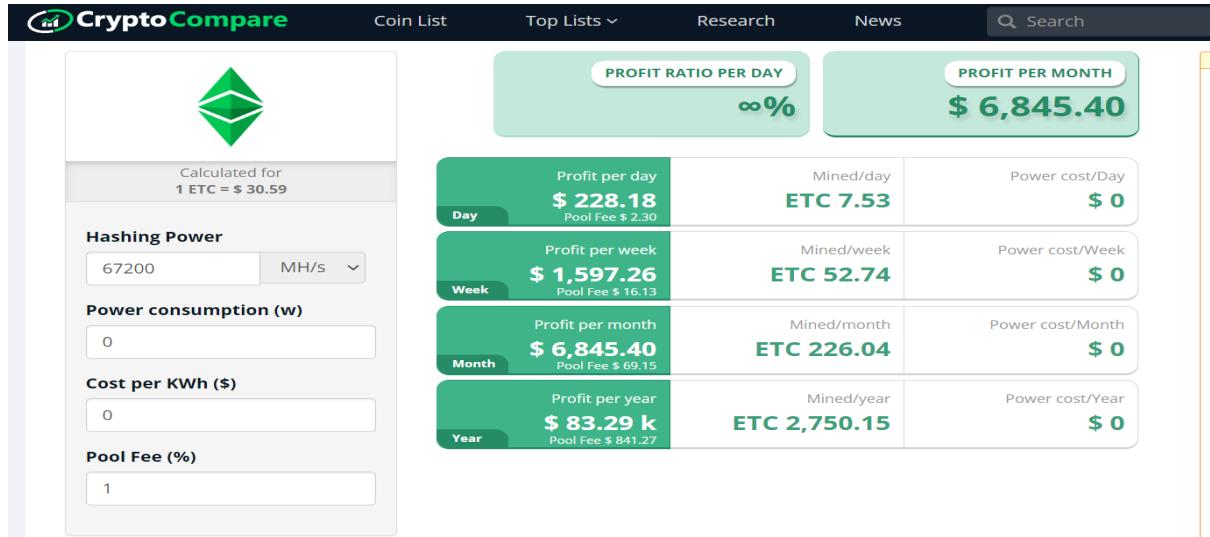
There is no profit made by Ethereum for 5 years. It's a loss of **-\$750,600**. The invested amount was **\$9,214,055.4**. Overall, it's a loss of **\$9,964,655.4** to the investor.

For raven coin, though it made a profit in the 5 years (\$1,137,819.612), it is not enough to buy back the hardware. It's a **loss** of **\$8,076,235.788** to the investor.

For private cloud for configuration 3, the cost for electricity is \$0.07.

Assuming the electricity is generated through solar panels or there is no cost for electricity or cooling the equipment due to environmental condition, it will bring down the amount invested by 2.6M and the total investment would be around \$6.5M. However, the profit generated through Ethereum(\$410,700) or Ravencoin(\$2,357,787.966) will not buy back the invested amount to purchase hardware and generate profit to the investor in 5 years.

Ethereum:



Ravencoin:

PERIOD	EST. REWARD	EST. INCOME	COSTS	EST. PROFIT
Last 1h	2071.48 RVN	54.1666 USD 0.00086721 BTC	-0.00 USD -0.00000000 BTC	54.1666 USD 0.00086721 BTC
Last 24h	50286.84 RVN	1303.3135 USD 0.02086605 BTC	-0.00 USD -0.00000000 BTC	1303.3135 USD 0.02086605 BTC
Last 7 days	347883.31 RVN	8506.4900 USD 0.13618891 BTC	-0.00 USD -0.00000000 BTC	8506.4900 USD 0.13618891 BTC
Current daily	49774.43 RVN	1309.8822 USD 0.02097121 BTC	-0.00 USD -0.00000000 BTC	1309.8822 USD 0.02097121 BTC
Current for 7 days	348421.02 RVN	9169.1754 USD 0.14679850 BTC	-0.00 USD -0.00000000 BTC	9169.1754 USD 0.14679850 BTC
Current for 30 days	1493232.95 RVN	39296.4661 USD 0.62913642 BTC	-0.00 USD -0.00000000 BTC	39296.4661 USD 0.62913642 BTC

In conclusion, for configuration3, crypto currency mining led to losses in 5 years through renting public cloud and buying private cloud. Looking at the profits generated in 5 years, public cloud losses are less comparatively when there is cost for electricity for private cloud. When there is minimal to no electricity cost for private cloud, the profits are better for private cloud. However, it will not make any profit to the investor in 5 years.

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