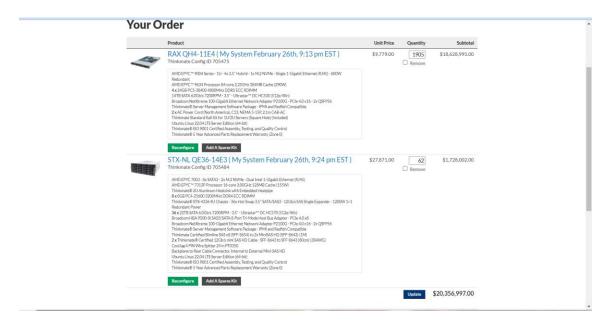# CS553 Cloud Computing Homework 3
Understanding the cost of Cloud Computing

A20556560

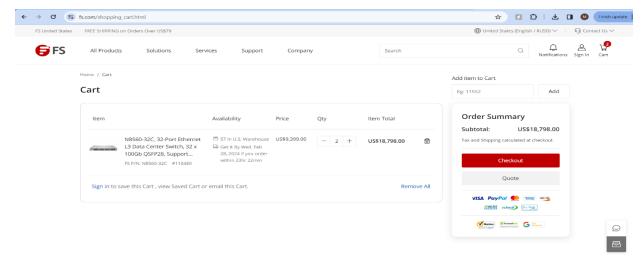Mansi Dinesh

mdinesh@hawk.iit.edu

Question 1.

Configuration 1: Hadoop/Spark Cluster with 160K-cores, 128TB memory, 24PB HDD, and 100Gb/s Ethernet Fat-Tree network (each VM should be equivalent to the d3.8xlarge instance); in addition to the compute resources, a 48PB distributed storage shared across the entire cloud should be procured, with the expectation that 48PB of data will be read and written to S3 every year from outside of Amazon with enough capacity for 1GB/sec throughput (for pricing comparison, see S3 Standard). For EC2, you must use the reserved instance pricing with a standard 5-year term
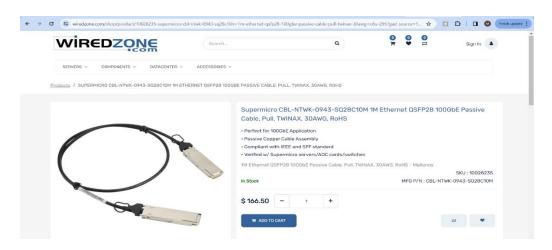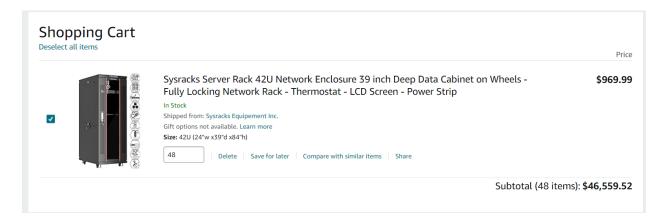

SWITCHES

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Eg: 11552   Add

Item	Availability	Price	Qty	Item Total
N8560-32C, 32-Port Ethernet L3 Data Center Switch, 32 x 100Gb QSFP28, Support... FS P/N: N8560-32C #110480	📦 57 In U.S. Warehouse 🚚 Get It By Wed. Feb 28, 2024 if you order within 23hr 22min	US$9,399.00	− 2 +	US$18,798.00 🗑

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Subtotal: US$18,798.00

Tax and Shipping calculated at checkout.

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Products / SUPERMICRO CBL-NTWK-0943-SQ28C10M 1M ETHERNET QSFP28 100GBE PASSIVE CABLE, PULL, TWINAX, 30AWG, ROHS

Supermicro CBL-NTWK-0943-SQ28C10M 1M Ethernet QSFP28 100GbE Passive Cable, Pull, TWINAX, 30AWG, RoHS

• Perfect for 100GbE Application
• Passive Copper Cable Assembly
• Compliant with IEEE and SFF standard
• Verified w/ Supermicro servers/AOC cards/switches

1M Ethernet QSFP28 100GbE Passive Cable, Pull, TWINAX, 30AWG, RoHS - Mellanox

SKU : 10028235

In Stock   MFG P/N : CBL-NTWK-0943-SQ28C10M

$ 166.50   − 1 +   🛒 ADD TO CART   ⇄ ❤

RACKS

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Price

☑   Sysracks Server Rack 42U Network Enclosure 39 inch Deep Data Cabinet on Wheels - Fully Locking Network Rack - Thermostat - LCD Screen - Power Strip   **$969.99**

In Stock
Shipped from: Sysracks Equipement Inc.
Gift options not available. Learn more
Size: 42U (24"w x39"d x84"h)

48 | Delete | Save for later | Compare with similar items | Share

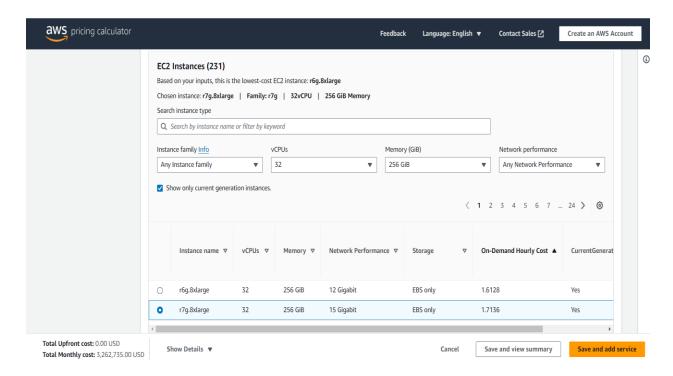Subtotal (48 items): **$46,559.52**

Total cores=84*1905=160,020 cores
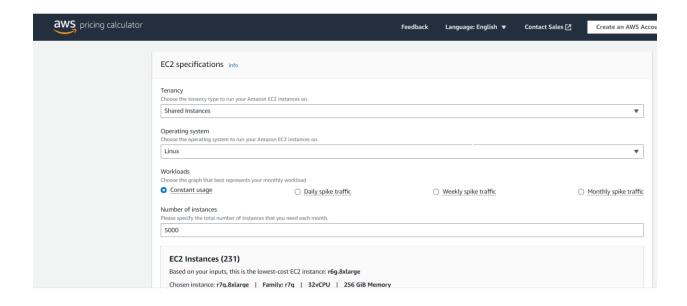
Power consumption for 1 Server = 458.2 Watts/hr

Cost per hour for 1905 servers = 130.93 USD (assuming rate=0.15kwh) for 5 years 130.93*24*365*5 =5,734,734.00
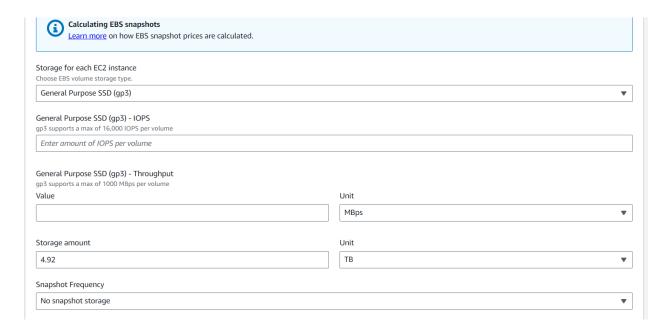
JBOD Storage- 1 unit power consumption = 150.0 Watts/hr

Cost per hour for 93 JBOD = 2.09 USD For 5 Years 2.09*24*365*5 = 91,542.00

	Description	Price per item	Quantity	Total price (5 years)
Compute Server	RAX QH4-11E4	$ 9,779.00	1905	$ 18,628,995.00
Network Switches	Arista DCS-7170-64C 64 port QSFP switch	$ 4,999.00	30	$ 149,970.00
	N8560-32C,32 Port L3 Data Centre switch,32*100GB	$ 9,399.00	2	$ 18,798.00
Network Cables	Supermicro CBL-NTWK-0943-SQ28C10M 1M Ethernet QSFP28 100GbE Passive Cable, Pull, TWINAX, 30AWG, RoHS	$ 166.50	2332	$ 388,278.00
Racks	Sysracks Server Rack 42U Network Enclosure 39 inch Deep Data Cabinet on Wheels - Fully Locking Network Rack - Thermostat - LCD Screen - Power Strip	$ 969.99	48	$ 46,559.52
Storage Server	STX-NL QE36-14E3	$ 27,871.00	62	$ 1,728,002.00
Electric power				$ 5,826,276
Cooling				$ 5,826,276
Administration	Require 1 admin for each 1000 servers	$ 150,000	2	$ 300,000
Total				$ 32,913,154.5

PUBLIC CLOUD

aws pricing calculator

Feedback   Language: English ▼   Contact Sales ⧉   Create an AWS Account

EC2 Instances (231)

Based on your inputs, this is the lowest-cost EC2 instance: **r6g.8xlarge**

Chosen instance: **r7g.8xlarge** | **Family: r7g** | **32vCPU** | **256 GiB Memory**

Search instance type

🔍 *Search by instance name or filter by keyword*

Instance family Info	vCPUs	Memory (GiB)	Network performance
Any Instance family ▼	32 ▼	256 GiB ▼	Any Network Performance ▼

☑ Show only current generation instances.

‹ 1 2 3 4 5 6 7 … 24 › ⚙

Instance name ▽	vCPUs ▽	Memory ▽	Network Performance ▽	Storage ▽	On-Demand Hourly Cost ▲	CurrentGenerat
○ r6g.8xlarge	32	256 GiB	12 Gigabit	EBS only	1.6128	Yes
◉ r7g.8xlarge	32	256 GiB	15 Gigabit	EBS only	1.7136	Yes

Total Upfront cost: 0.00 USD
Total Monthly cost: 3,262,735.00 USD

Show Details ▼

Cancel   Save and view summary   **Save and add service**

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 (231)
Based on your inputs, this is the lowest-cost EC2 instance: **r6g.8xlarge**

Chosen instance: **r7q.8xlarge** | Family: **r7q** | **32vCPU** | **256 GiB Memory**

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

Storage for each EC2 instance
Choose EBS volume storage type.

General Purpose SSD (gp3) ▼

General Purpose SSD (gp3) - IOPS
gp3 supports a max of 16,000 IOPS per volume

Enter amount of IOPS per volume

General Purpose SSD (gp3) - Throughput
gp3 supports a max of 1000 MBps per volume

Value	Unit
	MBps ▼

Storage amount	Unit
4.92	TB ▼

Snapshot Frequency

No snapshot storage ▼

Standard Reserved Plan:

▼ 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: 567.43/Month

Convertible Reserved Instances

Learn more

Reservation term
○ 1 year
● 3 year

Payment Options
● No upfront
○ Partial upfront
○ All upfront

Upfront: 0.00

Monthly: 652.55/Month

EC2 Instance

aws pricing calculator

Feedback   Language: English ▼   Contact Sales 🔗   Create an AWS Account

⊘ Successfully added Amazon EC2 estimate.   ✕

AWS Pricing Calculator > My Estimate

My Estimate Edit ✎   Export ▼   Share

Estimate summary Info

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	4,852,377.00 USD	**58,228,524.00 USD** Includes upfront cost

Getting Started with AWS

Get started for free   Contact Sales

My Estimate   Duplicate Delete Move to   Create group   Add support   **Add service**

🔍 Find resources   ‹ 1 › ⚙

☐	Service Name ▽	Status ▽	Upfront cost ▽	Monthly cost ▽	Description ▽	Region ▽	Config Summary ▽
☐	Amazon EC2 ✎	-	0.00 USD	4,852,377.00 USD	-	US East (Ohio)	Tenancy (Shared Inst...

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On Demand plan:

On-Demand
Maximize flexibility. Learn more

Expected utilization
Enter the expected usage of Amazon
EC2 instances

Usage

100

Usage type

Utilization percent per mo... ▼

Instance: 1.7136/Hour

Monthly: 1250.93/Month

EC2 Instance:

⊘ Successfully deleted Amazon Simple Storage Service (S3)estimate.

AWS Pricing Calculator > My Estimate

My Estimate Edit ✎

Export ▼   Share

Estimate summary Info

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	8,269,872.00 USD	**99,238,464.00 USD** Includes upfront cost

Getting Started with AWS

Get started for free   Contact Sales

My Estimate

Duplicate   Delete   Move to   Create group   Add support   **Add service**

🔍 Find resources

⟨ 1 ⟩ ⚙

	Service Name ▽	Status ▽	Upfront cost ▽	Monthly cost ▽	Description ▽	Region ▽	Config Summary ▽
☐	Amazon EC2 ✎	-	0.00 USD	8,269,872.00 USD	-	US East (Ohio)	Tenancy (Shared Inst…

S3 Storage:

S3 Standard feature

▼ S3 Standard Info

The calculations below exclude Free Tier discounts.

S3 Standard storage

| 49152 |

Unit

| TB per month ▼ |

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 lifecycling 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* |

aws pricing calculator   Feedback   Language: English ▼   Contact Sales ⬈   Create an AWS Account

Estimate summary Info

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	3,578,001.41 USD	**42,936,016.92 USD** Includes upfront cost

Getting Started with AWS

Get started for free   Contact Sales

My Estimate

Duplicate   Delete   Move to   Create group   Add support   **Add service**

	Service Name	▽	Status	▽	Upfront cost	▽	Monthly cost	▽	Description	▽	Region	▽	Config Summary	▽
☐	Amazon Simple Stora… ✎		-		0.00 USD		3,578,001.41 USD		-		US East (Ohio)		S3 Standard storage (…	

S3 Storage for 1 year = $ 42,936,016.92

S3 Storage for 5 year = $ 214,680,084

Standard Reserved cost for 1 year = $ 58,228,524

Standard Reserved cost for 5 year = $ 291,142,620

On-Demand cost of 1 year = $ 99,238,464.00
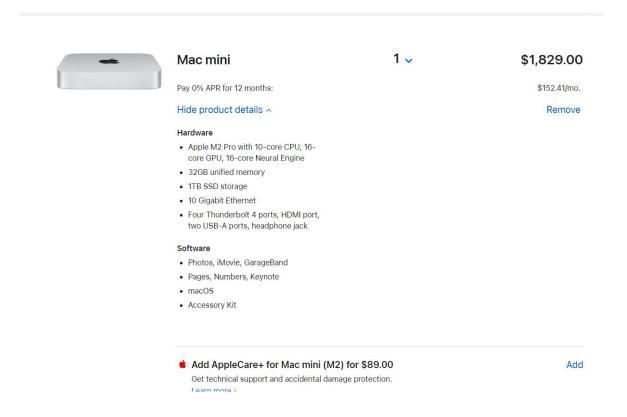
On-Demand cost of 5 year = $ 496,192,320

Conclusion:

Public cloud for 5 years	
Standard reserved cost	$ 505,822,704
On-demand cost	$ 710,872,404
Private cloud cost	$ 32,913,154.5

Question 2.

Configuration 2: Support 1K application developers who are designing MacOS and iPad OS applications. They require a MacOS system with 6-cores (3GHz), 32GB RAM, 1TB storage, and 10Gb/s network (Amazon has mac1.metal instances that have everything you need except the 1TB storage, which you can provision through EBS). The developers work 40 hours/week, 48 weeks/year (they get 4 weeks of vacation per year). You must use on-demand EC2 pricing as developers are expected to provision their systems at the beginning of each working day, and release their systems at the end of each working day.

Mac mini   1 ⌄   **$1,829.00**

Pay 0% APR for 12 months: $152.41/mo.

Hide product details ⌃   Remove

Hardware
- Apple M2 Pro with 10-core CPU, 16-core GPU, 16-core Neural Engine
- 32GB unified memory
- 1TB SSD storage
- 10 Gigabit Ethernet
- Four Thunderbolt 4 ports, HDMI port, two USB-A ports, headphone jack

Software
- Photos, iMovie, GarageBand
- Pages, Numbers, Keynote
- macOS
- Accessory Kit

 Add AppleCare+ for Mac mini (M2) for $89.00   Add
Get technical support and accidental damage protection.
Learn more ›

Each developer needs a Mac 1829*1000 = 1,829,000

Power consumption for each Mac is 185 Watt/hr

So for 1000 developers the power consumption is 185kw/hr

As the developers work 40 hours a week and 48 weeks a year = 40*48*185=355,200kw/hr

Assuming 0.15 USD per Kilowatt =$ 53,280.00
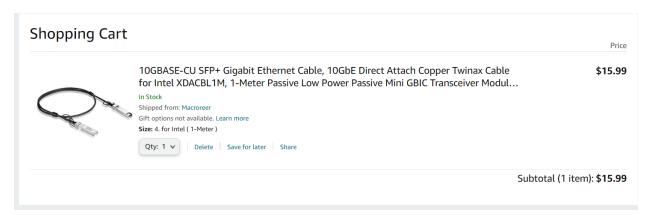
When a mini Mac will be ideal, it consumes 7 Watt/hr, therefore for 1000 mac it is 7kw/hr

Mac is going to be ideal for 128 hours a week as the developer works for 40 hours a week =128*48*7 = 43,008kw/hr

When the developers won't be working for 6840 hours= 6840*7=47,880kw/hr
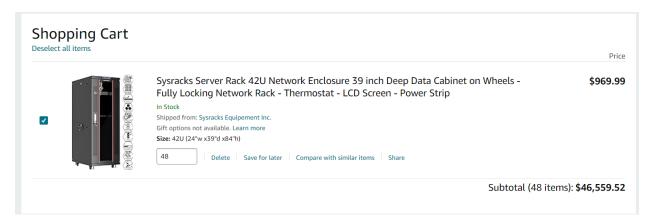
Total amount of $ 60,462 for 1 year

For 5 year it is $ 302,310

CABLE

Shopping Cart

|		Price
10GBASE-CU SFP+ Gigabit Ethernet Cable, 10GbE Direct Attach Copper Twinax Cable for Intel XDACBL1M, 1-Meter Passive Low Power Passive Mini GBIC Transceiver Modul…		$15.99

In Stock
Shipped from: Macroreer
Gift options not available. Learn more
Size: 4. for Intel (1-Meter)

Qty: 1 ∨   Delete   Save for later   Share

Subtotal (1 item): **$15.99**
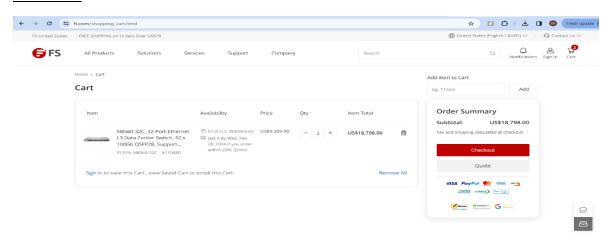
Racks

SWITCHES
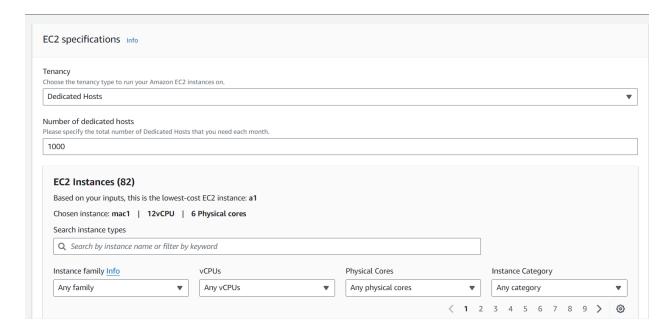
	Description	Price per item	Quantity	Total price (5 years)
Compute Server	Mac mini	$ 1,829.00	1000	$ 1,829,000
Network Switches	N8560-32C,32 Port L3 Data Centre switch,32*100GB	$ 9,399.00	32	$ 300,768
Network Cables	10GBASE-CU SFP+ Gigabit Ethernet Cable, 10GbE Direct Attach Copper Twinax Cable for Intel XDACBL1M, 1-Meter Passive Low	$ 15.99	1050	$ 16,789.5
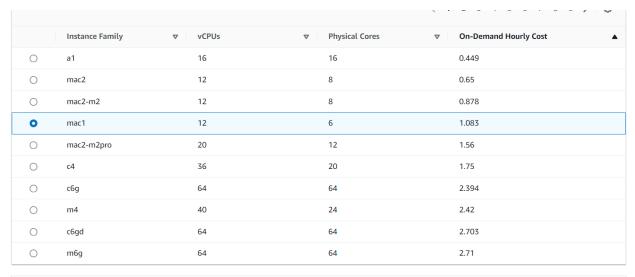
	Power Passive Mini GBIC Transceiver Module DAC Cables			
Racks	Sysracks Server Rack 42U Network Enclosure 39 inch Deep Data Cabinet on Wheels - Fully Locking Network Rack - Thermostat - LCD Screen - Power Strip	$ 969.99	24	$ 23,279.76
Storage Server	NA			
Electric power				$ 60,462
Cooling				$ 60,462
Administration	Require 1 admin for each 500 servers	$ 150,000	2	$ 300,000
Total				$ 2,590,761.26

For 5 years the total cost will be $ 2,890,761.26
PUBLIC CLOUD

Specifications

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

Storage per instance

Storage for each EC2 instance
Choose EBS volume storage type.

General Purpose SSD (gp2)   ▼

Storage amount   Unit

| 1 | | TB   ▼ |

▶ Show calculations

	Instance Family	▽	vCPUs	▽	Physical Cores	▽	On-Demand Hourly Cost	▲
○	a1		16		16		0.449	
○	mac2		12		8		0.65	
○	mac2-m2		12		8		0.878	
●	mac1		12		6		1.083	
○	mac2-m2pro		20		12		1.56	
○	c4		36		20		1.75	
○	c6g		64		64		2.394	
○	m4		40		24		2.42	
○	c6gd		64		64		2.703	
○	m6g		64		64		2.71	

EC2 Instance

aws pricing calculator   Feedback   Language: English ▼   Contact Sales ⧉   Create an AWS Account

⊘ Successfully deleted Amazon Simple Storage Service (S3)estimate.   ✕

AWS Pricing Calculator > My Estimate

My Estimate Edit ✎   Export ▼   Share

Estimate summary Info   ### Getting Started with AWS

Upfront cost   Monthly cost   Total 12 months cost
0.00 USD   892,990.00 USD   10,715,880.00 USD   Get started for free   Contact Sales
                                            Includes upfront cost

My Estimate   Duplicate   Delete   Move to   Create group   Add support   Add service

🔍 Find resources   ‹ 1 ›   ⚙

	Service Name	▽	Status	▽	Upfront cost	▽	Monthly cost	▽	Description	▽	Region	▽	Config Summary	▽
☐	Amazon EC2	✎	-		0.00 USD		892,990.00 USD		-		US East (Ohio)		Tenancy (Dedicated H...	

This is the total cost for 1 year with continuous work.

There are 1000 developers working 40 hours a week and 48 weeks a year, we calculate = 40*48*1.083=779.76*1000 =$ 779760

For every one person using this instance over a week will be charged around $ 43.32

For a single person using this instance for a whole year will be $ 2079.36

The team of thousand developers working on it for 5 years will be charged $ 10,396,800 just for the

compute instance

For storage of 1TB we will be considering the General Purpose SSD (gp3) - Storage EBS from AWS

This storage costs around $ 0.08 GB / Month

This storage will be charged $ 983,040 for 1000 developers for one year

Over a tenure of 5 years the total charge for the above listed storage will be $ 4,915,200

The combined cost of these cloud instances and storage will be $ 15,312,000.00
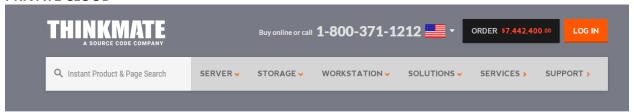
Private cloud for 5 years	$ 2,890,761.26
Public cloud for 5 years	$ 15,312,000.00

Question 3.
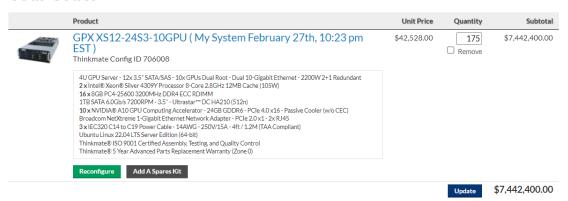
Configuration 3: Ethereum crypto currency mining; you have an investor who has $10M to buy hardware to mine Raven Coin RVN (and pay for maintance / sys admin, power, and cooling), or rent resources from Amazon EC2 to mine Raven Coin. Configure the best hardware you can from ThinkMate. For buying hardware solution, make sure to leave funds to pay for power, cooling, and system administrator. Raven Coin mining can be done on any compute hardware (CPUs or GPUs), but you will likely find that its most profitable to mine using GPUs. Since Ethereum mining is compute intensive, your processor, memory, hard drive, and network requirements are minimal (4-cores, 8GB RAM, 100GB HDD, and 1Gb/sec network). Identify the best Amazon instance (you must use Spot Instances to make sure you get the best hardware for the cheapest price); although spot pricing fluctuates over time, you can assume the spot price will remain fixed for the duration of your evaluation. For the purchase of the hardware scenario, you are free to locate the hardware in any state in the USA (for a full list of average electricity cost by state, see https://www.chooseenergy.com/electricity-rates-by-state/); since this will be a business venture, use the business electricity rates. If electricity is too expensive to make a profit, invest part of the $1M in solar power (solar panels), and estimate the amount of energy you can extract. For an overview of various GPUs and their respective hashrates (the higher the hashrates, the more Raven Coin that can be mined), see https://whattomine.com (KawPow); this online resource has an even more exhaustive list of GPUs and their hashrate; https://www.betterhash.net/mining/gpu/?page=1. Once you have a hashrate, you can estimate how much money can be made mining Ethereum by using an online caluclator such as https://www.cryptocompare.com/mining/calculator/eth?HashingPower=0&HashingUnit=MH%2Fs&Powe rConsumption=0&CostPerkWh=0&MiningPoolFee=1. The mining calculator gives an instantanous mining number, although in reality the amount of coin that can be mined would vary based on many factors (hash rate, hash difficulty, fees, etc). The profit similarly can vary based on the Raven Coin pricing, which can vary wildly. When computing the mining coins and expected profit, you can use the caluclator above to compute it for a 5-year period, assuming the mining continues at the same rate, and the price remains at the same level. Your task is to compute the amount of profit that is expected after $10M is invested in buying hardware and running it for 5-years, vs. renting the hardware from Amazon. Its possible that the profits you make will be less than the original investment (especially with the Amazon scenario)
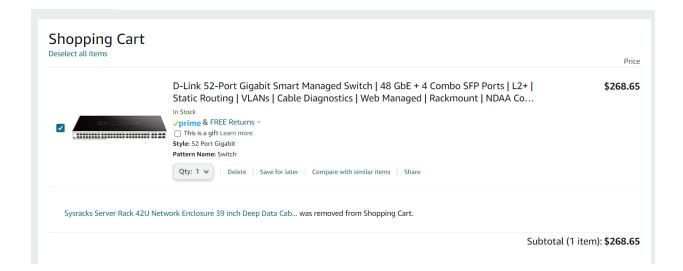
We will use a 52 port switch with the lowest price and minimum requirements to host many servers.

PRIVATE CLOUD

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A SOURCE CODE COMPANY

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Your Order

Product	Unit Price	Quantity	Subtotal
GPX XS12-24S3-10GPU (My System February 27th, 10:23 pm EST) Thinkmate Config ID 706008	$42,528.00	175 ☐ Remove	$7,442,400.00

4U GPU Server - 12x 3.5" SATA/SAS - 10x GPUs Dual Root - Dual 10-Gigabit Ethernet - 2200W 2+1 Redundant
2 x Intel® Xeon® Silver 4309Y Processor 8-Core 2.8GHz 12MB Cache (105W)
16 x 8GB PC4-25600 3200MHz DDR4 ECC RDIMM
1TB SATA 6.0Gb/s 7200RPM - 3.5" - Ultrastar™ DC HA210 (512n)
10 x NVIDIA® A10 GPU Computing Accelerator - 24GB GDDR6 - PCIe 4.0 x16 - Passive Cooler (w/o CEC)
Broadcom NetXtreme 1-Gigabit Ethernet Network Adapter - PCIe 2.0 x1 - 2x RJ45
3 x IEC320 C14 to C19 Power Cable - 14AWG - 250V/15A - 4ft / 1.2M (TAA Compliant)
Ubuntu Linux 22.04 LTS Server Edition (64-bit)
Thinkmate® ISO 9001 Certified Assembly, Testing, and Quality Control
Thinkmate® 5 Year Advanced Parts Replacement Warranty (Zone 0)

Reconfigure   **Add A Spares Kit**

Update   **$7,442,400.00**

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Style: 52 Port Gigabit
Pattern Name: Switch

$268.65

Qty: 1 ⌄ | Delete | Save for later | Compare with similar items | Share

Sysracks Server Rack 42U Network Enclosure 39 inch Deep Data Cab... was removed from Shopping Cart.

Subtotal (1 item): **$268.65**

Shopping Cart

Cat7 Ethernet Cable - 25 ft - RJ45 Connector - Double Shielded STP - 10 Gigabit 600MHz - Cat 7 Premium High Speed Network Wire Patch Cable (7.5m) LAN Cord - 25...

$13.99

In Stock
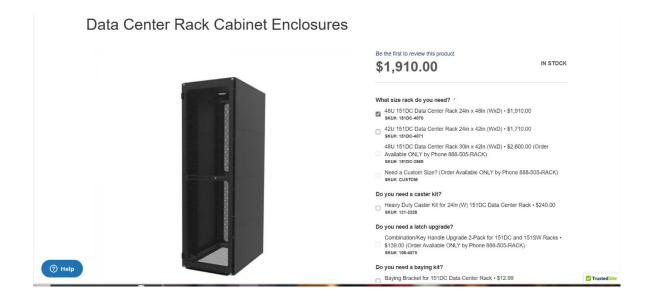
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Size: 25 feet Cat 7

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Data Center Rack Cabinet Enclosures

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What size rack do you need? *

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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) • $2,600.00 (Order Available ONLY by Phone 888-505-RACK)
SKU#: 151DC-3969

☐ 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#: 131-2328

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#: 106-4075

Do you need a baying kit?

☐ Baying Bracket for 151DC Data Center Rack • $12.99

? Help

TrustedSite

	Description	Price per item	Quantity	Total price (5 years)
Compute Server	GPX XS12-24S3-10GPU (My System February 27th, 10:23 pm EST)	$ 42,528.00	175	$ 7,442,400.00
Network Switches	D-Link 52-Port Gigabit Smart Managed Switch | 48 GbE + 4 Combo SFP Ports | L2+ | Static Routing | VLANs | Cable Diagnostics | Web Managed | Rackmount | NDAA Compliant | Lifetime Warranty (DGS-1210-52)	$ 268	4	$ 1,072
Network Cables	Cat 7 Ethernet Cable 25 ft LAN Cable Internet Network Cord for PS4, Xbox, Router, Modem, Gaming, White Flat Shielded 10 Gigabit RJ45 High Speed Computer Patch Wire.	$ 13.99	179	$ 2,504.21
Racks	48U 151DC Data Center Rack 24in x 48in (WxD) 151DC4070	$ 1,910	5	$ 9,550
Storage Server	NA			
Electric power				$ 1,384,775
Cooling				$ 1,384,775
Administration	Require 1 admin for each 100 servers	$ 150,000	2	$ 300,000
Total				$ 17,971,052.4

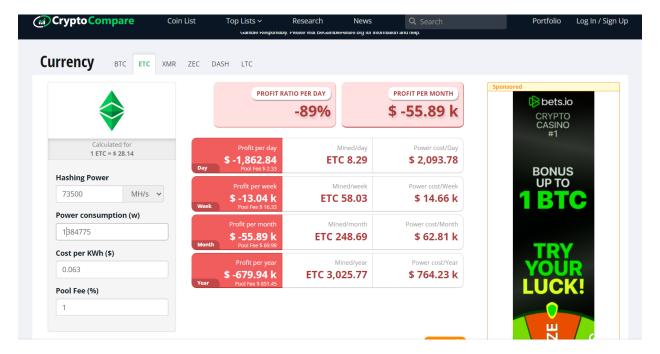Power comsumption rate for one server = 2,868.5 W/h = 2.868kw/hr

Power consumption for 1 year = 2.868*24*365= 25,123.68
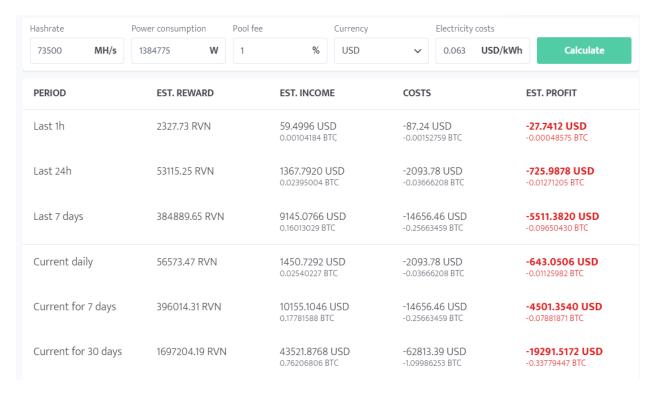
Power consumption for 5 years = 125,618.4

Total cost for 5 years for 1 device=7,913.95 USD

For 175 machines = $ 1,384,775
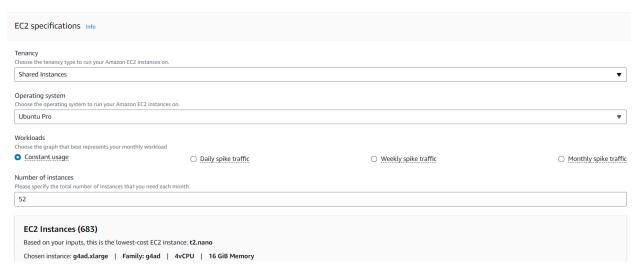
Private EHERIUM COST:

RAVN Coin estimate:

Hashrate	Power consumption	Pool fee	Currency	Electricity costs	
73500 MH/s	1384775 W	1 %	USD	0.063 USD/kWh	Calculate

PERIOD	EST. REWARD	EST. INCOME	COSTS	EST. PROFIT
Last 1h	2327.73 RVN	59.4996 USD 0.00104184 BTC	-87.24 USD -0.00152759 BTC	**-27.7412 USD** -0.00048575 BTC
Last 24h	53115.25 RVN	1367.7920 USD 0.02395004 BTC	-2093.78 USD -0.03666208 BTC	**-725.9878 USD** -0.01271205 BTC
Last 7 days	384889.65 RVN	9145.0766 USD 0.16013029 BTC	-14656.46 USD -0.25663459 BTC	**-5511.3820 USD** -0.09650430 BTC
Current daily	56573.47 RVN	1450.7292 USD 0.02540227 BTC	-2093.78 USD -0.03666208 BTC	**-643.0506 USD** -0.01125982 BTC
Current for 7 days	396014.31 RVN	10155.1046 USD 0.17781588 BTC	-14656.46 USD -0.25663459 BTC	**-4501.3540 USD** -0.07881871 BTC
Current for 30 days	1697204.19 RVN	43521.8768 USD 0.76206806 BTC	-62813.39 USD -1.09986253 BTC	**-19291.5172 USD** -0.33779447 BTC

PUBLIC CLOUD

Specifications

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.

Ubuntu Pro ▼

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.

52

EC2 Instances (683)

Based on your inputs, this is the lowest-cost EC2 instance: **t2.nano**

Chosen instance: **g4ad.xlarge** | **Family: g4ad** | **4vCPU** | **16 GiB Memory**

	Instance name ▽	vCPUs ▽	Memory ▽	Network Performance ▽	Storage ▽	On-Demand Hourly Cost ▲	CurrentGeneration ▽	Potential Effective Hourly Cost (Savings %) ▽
●	g4ad.xlarge	4	16 GiB	Up to 10 Gigabit	150 GB NVMe SSD	0.38553	Yes	0.0000 (100%)
○	g4dn.xlarge	4	16 GiB	Up to 25 Gigabit	125 GB NVMe SSD	0.533	Yes	0.0000 (100%)
○	g4ad.2xlarge	8	32 GiB	Up to 10 Gigabit	300 GB NVMe SSD	0.55517	Yes	0.0000 (100%)
○	g4dn.2xlarge	8	32 GiB	Up to 25 Gigabit	225 GB NVMe SSD	0.766	Yes	0.0000 (100%)
○	g4ad.4xlarge	16	64 GiB	Up to 10 Gigabit	600 GB NVMe SSD	0.895	Yes	0.0000 (100%)
○	g4dn.4xlarge	16	64 GiB	Up to 25 Gigabit	225 GB NVMe SSD	1.232	Yes	0.0000 (100%)
○	g4ad.8xlarge	32	128 GiB	15 Gigabit	1200 GB NVMe SSD	1.79	Yes	0.0000 (100%)
○	g4dn.8xlarge	32	128 GiB	50 Gigabit	900 GB NVMe SSD	2.232	Yes	0.0000 (100%)
○	g4ad.16xlarge	64	256 GiB	25 Gigabit	2400 GB NVMe SSD	3.58	Yes	0.0000 (100%)
○	g4dn.12xlarge	48	192 GiB	50 Gigabit	900 GB NVMe SSD	3.996	Yes	0.0000 (100%)

● 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 g4ad.xlarge is 0%

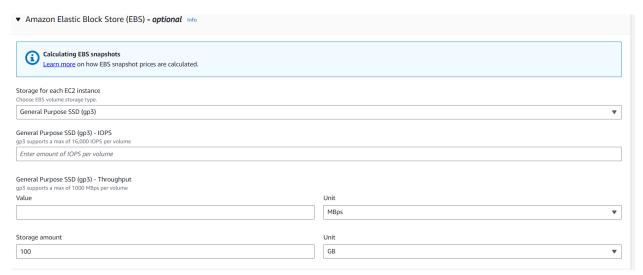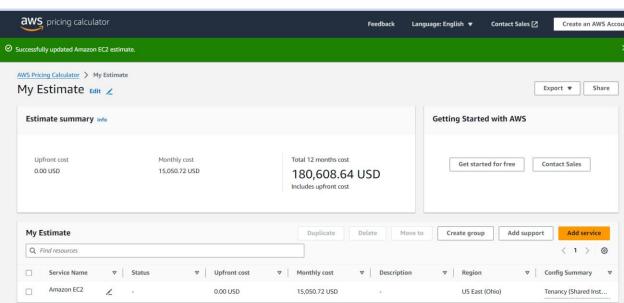Assume percentage discount for my estimate

```
0
```

ℹ **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: 0.38553/Hour

Monthly: 14634.72/Month

▼ 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.

General Purpose SSD (gp3)	▼

General Purpose SSD (gp3) - IOPS
gp3 supports a max of 16,000 IOPS per volume

Enter amount of IOPS per volume

General Purpose SSD (gp3) - Throughput
gp3 supports a max of 1000 MBps per volume

Value

	Unit	
	MBps	▼

Storage amount

	Unit	
100	GB	▼

Feedback   Language: English ▼   Contact Sales ⧉   Create an AWS Accou

⊘ Successfully updated Amazon EC2 estimate.

AWS Pricing Calculator > My Estimate

My Estimate Edit ✎

Export ▼   Share

Estimate summary Info

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	15,050.72 USD	**180,608.64 USD** Includes upfront cost

Getting Started with AWS

Get started for free   Contact Sales

My Estimate

Duplicate   Delete   Move to   Create group   Add support   **Add service**

🔍 Find resources

⟨ 1 ⟩ ⚙

	Service Name ▽	Status ▽	Upfront cost ▽	Monthly cost ▽	Description ▽	Region ▽	Config Summary ▽
☐	Amazon EC2 ✎	-	0.00 USD	15,050.72 USD	-	US East (Ohio)	Tenancy (Shared Inst…

PUBLIC ETHERIUM COST

CryptoCompare	Coin List Top Lists ⌄ Research News	🔍 Search

Currency   BTC **ETC** XMR ZEC DASH LTC

Calculated for
1 ETC = $ 28.19

Hashing Power
9984   MH/s ⌄

Power consumption (w)
0

Cost per KWh ($)
0.063

Pool Fee (%)
1

PROFIT RATIO PER DAY	PROFIT PER MONTH
∞%	$ 942.78

	Profit per day	Mined/day	Power cost/Day
Day	$ 31.43 Pool Fee $ 0.3174	ETC 1.13	$ 0
Week	Profit per week $ 219.98 Pool Fee $ 2.22	Mined/week ETC 7.88	Power cost/Week $ 0
Month	Profit per month $ 942.78 Pool Fee $ 9.52	Mined/month ETC 33.78	Power cost/Month $ 0
Year	Profit per year $ 11.47 k Pool Fee $ 115.86	Mined/year ETC 411.01	Power cost/Year $ 0

Hashrate	Power consumption	Pool fee	Currency	Electricity costs	
9984 MH/s	0 W	1 %	USD	0.063 USD/kWh	Calculate

PERIOD	EST. REWARD	EST. INCOME	COSTS	EST. PROFIT
Last 1h	310.25 RVN	7.9622 USD 0.00013918 BTC	-0.00 USD -0.00000000 BTC	**7.9622 USD** 0.00013918 BTC
Last 24h	7220.28 RVN	185.8753 USD 0.00324910 BTC	-0.00 USD -0.00000000 BTC	**185.8753 USD** 0.00324910 BTC
Last 7 days	52239.15 RVN	1242.0100 USD 0.02171034 BTC	-0.00 USD -0.00000000 BTC	**1242.0100 USD** 0.02171034 BTC
Current daily	7430.65 RVN	190.6204 USD 0.00333205 BTC	-0.00 USD -0.00000000 BTC	**190.6204 USD** 0.00333205 BTC
Current for 7 days	52014.58 RVN	1334.3430 USD 0.02332432 BTC	-0.00 USD -0.00000000 BTC	**1334.3430 USD** 0.02332432 BTC
Current for 30 days	222919.61 RVN	5718.6129 USD 0.09996135 BTC	-0.00 USD -0.00000000 BTC	**5718.6129 USD** 0.09996135 BTC

AWS - 52 systems 1 year investment	180,608.64
AWS- 52 instances for 5 year investment	903,043.2
Etherium profit for 5 year	-3,399.7
Raven coin profit for 5 year	-1,157,491.03
Private- 175 instances for 5 year investment	$ 17,971,052.4
Etherium profit for 5 year	57,350
Raven coin profit for 5 year	343,116.6

Conclusion:

Having a private clone for Hadoop and Spark use cases is based on the initial configuration. A private cloud will show advantageous over a five-year period, based on the first configuration, i.e., for Hadoop and Spark use cases, since it will yield good profits with relatively small investments.

Better servers on the private cloud can further optimise the performance we can achieve with private cloud based on the second configuration. However, setting up an instance on a public cloud will cost a lot of money.

We can infer from the third configuration that using mining machines during this downturn will only result in losses. However, using a public cloud-based solution will guarantee that losses are comparatively lower than those associated with private cloud computing. This is mostly because of expensive electricity, even though Louisiana has the lowest power consumption rates at 0.063$/kWh.