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1. How much additional time is required?

Considering the additional business requirements. of High availability, ability to handle failovers, and Daily Backups. Which would be an additional 6-7 User Stories. Since they are major features

The allocated time for 200 User stories is 4 months, which is roughly 2 user stories per day.

Considering the developers would have to learn the new technology and implement testing, I would assign an additional 1 user story for 3 days. which would make the additional time required as 30 days

Hence, the total time would be 5 months.

<https://www.leadingagile.com/2015/05/agile-story-points-how-many-user-stories-per-sprint-rules-of-thumb/#:~:text=Most%20user%20stories%20shouldn't,in%20%20to%20%20days.>

<https://devm.io/testing/time-estimation-for-software-testing-128078>

2. What application deployment changes are required?

Considering the feature of 30 minutes of downtime per week on Sundays for maintenance.

The developers can schedule the sprints considering the weekly Sunday maintenance.

Due to the additional time added of one month. 2 additional sprints of 2 weeks each can be added to the schedule. Giving the developers sufficient time to incorporate all the features with sufficient testing.

Considering the Ability to handle failovers The use of Kubernetes and containers will make it easier to deploy and manage the application across servers. Additionally, the use of Amazon ECS provides built-in capabilities for load balancing, auto-scaling, and failover.

<https://aws.amazon.com/blogs/apn/making-application-failover-seamless-by-failing-over-your-private-virtual-ip-across-availability-zones/>

<https://avinetworks.com/glossary/failover/>

<https://pm.stackexchange.com/questions/2309/how-do-you-schedule-maintenance-work-in-scrum>

<https://medium.com/swlh/types-of-software-maintenance-2b0503848b43>

3. What additional team resources, if any, are required?

The additional team resources required are hiring an additional AWS Certified developer to assist with the setup of the system.

Since the business requires two major features High availability and Daily backups

The tools required to achieve this considering we are using Amazon ECS :

AWS Backup, to manage the daily back ups

[tps://aws.amazon.com/backup/](https://aws.amazon.com/backup/)

We have two options considering High availability the pay as you go plan provided by AWS or the Amazon EC2 Dedicated Hosts for high availability

<https://aws.amazon.com/ecs/>

<https://aws.amazon.com/ec2/dedicated-hosts/pricing/>

4. How would you calculate the additional cost to the project?

To calculate the additional costs of the project.

We consider the total additional task, from which we get the additional duration which is 1 month

The cost amount is then added by dividing the number of hours spent of each task by hourly rate of each team member.

In addition to that we would also consider the pricing to run the system on AWS backup

This is the pricing chart that AWS provides for data back up to understand how much

Region: AWS GovCloud (US-East) ↗		
Resource Type	Warm Storage	Cold Storage ^^
Amazon EFS File System Backup†	\$0.06 per GB-Month	\$0.012 per GB-Month
Amazon EBS Volume Snapshot	\$0.066 per GB-Month	n/a*
Amazon RDS Database Snapshot	\$0.095 per GB-Month	n/a*
Amazon Aurora Cluster Snapshot	\$0.036 per GB-Month	n/a*
Amazon DynamoDB Table Backup	\$0.12 per GB-Month	\$0.036 per GB-Month**

tps://aws.amazon.com/backup/

<https://www.farmerp.com/agricultural-data-collection-understanding-agritechs-role-in-gathering-farm-data#:~:text=The%20integration%20of%20high%2Dprecision,from%20anywhere%20with%20higher%20accuracy.>

We also consider the hosting prices for AWS ECS

Configure Amazon EC2 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.

2

EC2 Instances (538)

Based on your inputs, this is the lowest-cost EC2 instance: **t4g.medium**

Chosen instance: **t4g.nano** | Family: **t4g** | 2vCPU | 0.5 GiB Memory

Search instance type

Search by instance name or filter by keyword

Instance family Info

Any instance family

vCPUs

2

Memory (GiB)

4 GiB

Network performance

Up to 12500 Megabit

☒ Show only current generation instances.

< 1 2 3 4 5 6 7 ... 54 >

⊞

Instance family [info](#)

Any Instance family

2

4 GiB

Up to 12500 Megabit

☒ Show only current generation instances.

< 1 2 3 4 5 6 7 ... 54 > ⓘ

Instance name	vCPUs	Memory	Network Performance	Storage	On-Demand Hourly Cost	CurrentGeneration	Potential Effective Hourly Cost (Savings %)
<input type="radio"/> t4g.medium	2	4 GiB	Up to 5 Gigabit	EBS only	0.0336	Yes	0.0126 (62%)
<input type="radio"/> t3a.medium	2	4 GiB	Up to 5 Gigabit	EBS only	0.0376	Yes	0.0142 (62%)
<input type="radio"/> t3.medium	2	4 GiB	Up to 5 Gigabit	EBS only	0.0416	Yes	0.0156 (62%)
<input type="radio"/> t2.medium	2	4 GiB	Low to Moderate	EBS only	0.0464	Yes	0.0174 (62%)
<input type="radio"/> a1.large	2	4 GiB	Up to 10 Gigabit	EBS only	0.051	Yes	0.0192 (62%)
<input type="radio"/> t4g.large	2	8 GiB	Up to 5 Gigabit	EBS only	0.0672	Yes	0.0253 (62%)
<input type="radio"/> c6g.large	2	4 GiB	Up to 10 Gigabit	EBS only	0.068	Yes	0.0256 (62%)
<input type="radio"/> c7g.large	2	4 GiB	Up to 12500 Megabit	EBS only	0.0723	Yes	0.0277 (62%)
<input type="radio"/> t3a.large	2	8 GiB	Up to 5 Gigabit	EBS only	0.0752	Yes	0.0283 (62%)
<input type="radio"/> c6a.large	2	4 GiB	Up to 12500 Megabit	EBS only	0.0765	Yes	0.0293 (62%)

Payment options

Payment options

Payment options

Estimated commitment price based on the following selections:
Instance type: **t4g.nano** 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 about [Compute Savings Plans](#).

Reservation term

☐ 1 year

☒ 3 year

Payment Options

☐ No upfront

☐ Partial upfront

☒ All upfront

Upfront: 49.93

Monthly: 0.00/Month

☐ EC2 Instance Savings Plans

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

Reservation term

☐ 1 year

☒ 3 year

Payment Options

☐ No upfront

☐ Partial upfront

☒ All upfront

Upfront: 42.05

Monthly: 0.00/Month

☐ On-Demand

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

Expected utilization

Enter the expected usage of Amazon EC2 instances

Usage

100

Usage type

Utilization percent per month

Instance: 0.0042/Hour

Monthly: 3.07/Month

☐ Spot Instances

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

The historical average discount for t4g.nano is 55%

Assume percentage discount for my estimate

-1

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: 0.0042/Hour

Monthly: 6.19/Month

<https://docs.aws.amazon.com/AmazonECS/latest/bestpracticesguide/capacity-availability.html>