

# PragmaEdge



## Backup Policies for AWS Cloud

Prepared for Quest.

### Version History

Version No.	Date	Brief description of changes	Author
1.0	02/27/2024	Created	Chandu.Boddula

## **Table of Contents**

1. Introduction .....	3
1.1 Purpose .....	3
1.2 Scope .....	3
2. Backup Policy Architecture of Block Storage Volumes .....	4
2.1 Backup Policy for Quest Servers: .....	4
2.1.2 Production Backup Policy setup: .....	5
2.2 Backup Plan for the Policy: .....	5
2.3 Non-production Backup Policy .....	6
2.3.1 Non_Production Backup Policy setup: .....	6
2.4 Restore Process: .....	7
3. RDS Database .....	9
3.1 RDS Database Backup Architecture .....	9
3.2 RDS Database Backup Policy .....	10
3.3 RDS Database Restore Process: .....	11
3.4 Manual Backup Process in RDS .....	11
4. EFS PROD BACKUP ARCHITECTURE .....	13
4.1 EFS backup Policy .....	14
4.2 Restore EFS from AWS Backup Vault .....	15

## 1. Introduction

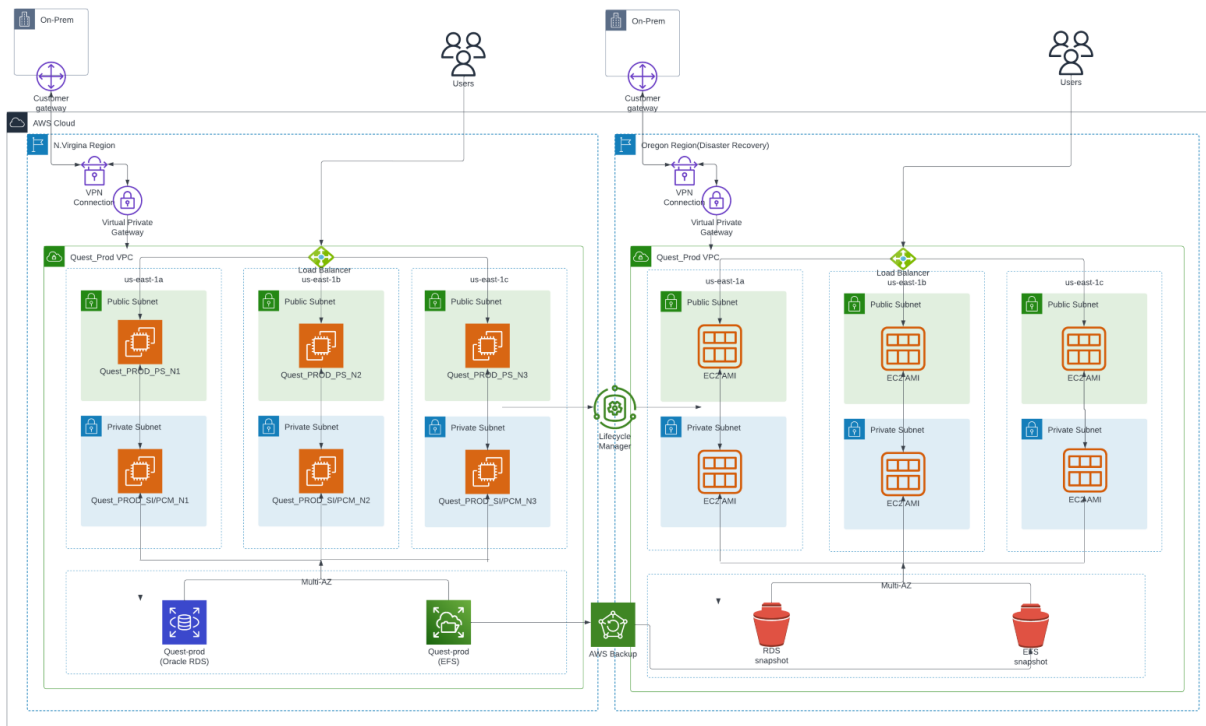
### 1.1 Purpose

This document walks you through the processes and procedures for backup policies and restoration within Quest infrastructure hosted in the AWS Cloud. Its primary purpose is to ensure regular backups with associated retention policies.

### 1.2 Scope

This document can be referred to for block storages of virtual machines, databases, EFS provisioned on Quest. This document is used to keep track of the resources which we provisioned on AWS Cloud have all the required strategies for the backup and getting to the source state with the backups and to follow the process same for the resources.

## 2. Backup Policy Architecture of Block Storage Volumes



The above architecture is of Quest client and how we are prepared for disaster recovery.

### 2.1 Backup Policy for Quest Servers:

- Backup Policy of the Production instance is set up with 2 Volumes attached to the Instance, backed up with the retention of 15 Days and have the 2 recovery points.
- We have two policies configured for this backup policy which takes backups at 1<sup>st</sup> day of every month and 16<sup>th</sup> day in another month which stores two server images that are stored in another region which helps in disaster recovery.

#### 2.1.1 Backup policy for the Quest Production servers:

- We have configured a backup policy for Quest production servers which takes backup of servers twice a month. We have given **Backup:Quest\_prod** tag to all the prod instances.

Backup Policy Name	Quest Prod Policy
--------------------	-------------------

<b>Applied Resources</b>	9 Virtual Servers
<b>Backup Plan Name</b>	Quest Prod Policy
<b>Retention Days</b>	30 Days
<b>Recovery Points</b>	2 AMIs
<b>Frequency</b>	On 1st and 16 <sup>th</sup> day of every month at 01:00 AM UTC

## 2.1.2 Production Backup Policy setup:

**Data Lifecycle Manager (3)** [Info](#)
↺ ↻ ⚙️ 🔍

All policies ▾

< 1 >

<input type="checkbox"/>	Name ▾	Policy ID ▾	Description ▾	Policy type
<input type="checkbox"/>	Quest Prod Policy	<a href="#">policy-0b7660e5e66a1df99</a>	Quest Prod Policy	EBS-backed AMI policy

## 2.2 Backup Plan for the Policy: Schedule - 1

Policy: **policy-0b7660e5e66a1df99**

### ▼ Schedule 1

#### Schedule details

Frequency	Variable tags
On the <b>1st</b> day every month starting at <b>01:00</b> UTC.	instance-id:\${instance-id}
Retain rule	Copy tags from source
A maximum of <b>1</b> will be retained.	true

## Schedule – 2

Policy: **policy-0b7660e5e66a1df99**















































### ▼ Schedule 2

#### Schedule details

Frequency	Variable tags
On the <b>16th</b> day every month starting at <b>01:00</b> UTC.	instance-id:\${instance-id}
Retain rule	Copy tags from source
A maximum of <b>1</b> will be retained.	true

## Backup Policy Applied Resources:

The instances with the tag: Quest\_PROD will be backed up with two schedules

	Name 	Instance ID	Instance state 	Instance type 	Status
<input checked="" type="checkbox"/>	Prod_SI/PCM_N3_06-Sep-24	i-0eafb7309abdd7945	 Running  	r5.xlarge	 2
<input type="checkbox"/>	Prod_PS2_06-Sep-24	i-03a5a83ef52712397	 Running  	t3.medium	 2
<input type="checkbox"/>	Prod_ICC_06-Sep-24	i-01c9ab637ec77637e	 Running  	r5.large	 2
<input type="checkbox"/>	Prod_PEM_Server_06-Sep-24 	i-0979419fd8ad60532	 Running  	r5.large	 2
<input type="checkbox"/>	Prod_SI/PCM_N1_06-Sep-24	i-065698a1679dc8d07	 Running  	r5.xlarge	 2
<input type="checkbox"/>	Prod_SI/PCM_N1_06-Sep-24	i-065698a1679dc8d07	 Running  	r5.xlarge	 2
<input type="checkbox"/>	Prod_PS3_06-Sep-24	i-05d641b8532103aed	 Running  	t3.medium	 2
<input type="checkbox"/>	Prod_PS1_06-Sep-24	i-03e249b4a27a23fbc	 Running  	t3.medium	 2
<input type="checkbox"/>	Prod_SI/PCM_N2_06-Sep-24 	i-06c48149f59de1f42	 Running  	r5.xlarge	 2
<input type="checkbox"/>	Ques_Jarvis_Prod_06-Sep-24	i-055e51ff8c59a2325	 Running  	t3.large	 2

## 2.3 Non-production Backup Policy

Non-Production backup policy is used to back up the volumes attached to the Non-Production Virtual Instances by using tags. These volumes will be backed up with consistency groups which includes Boot volume and Data volume of the Virtual Instance.

<b>Backup Policy Name</b>	Quest Non-prod Backup
<b>Applied Resources</b>	05 Virtual Instances
<b>Backup Plan Name</b>	Quest Non-prod Backup
<b>Retention Days</b>	30 Days
<b>Recovery Points</b>	2 AMIs
<b>Frequency</b>	On 1st and 16 <sup>th</sup> day of every month at 01:00 AM UTC

### 2.3.1 Non\_Production Backup Policy setup:

<input checked="" type="checkbox"/>	Quest Non-prod Backup	policy-0daa951725d6ff585	Quest Non-prod Backup	EBS-backed AMI policy
-------------------------------------	-----------------------	--------------------------	-----------------------	-----------------------

## Backup Plan for the Policy:

### Schedule –1

## Policy: policy-0daa951725d6ff585

### ▼ Schedule 1

#### Schedule details

##### Frequency

On the **1st** day every month starting at **01:00** UTC.

##### Variable tags

instance-id:\${instance-id}

##### Retain rule

A maximum of **1** will be retained.

##### Copy tags from source

true

## Schedule –2

## Policy: policy-0daa951725d6ff585

### ▼ Schedule 2

#### Schedule details

##### Frequency

On the **16th** day every month starting at **01:00** UTC.

##### Variable tags

instance-id:\${instance-id}

##### Retain rule

A maximum of **1** will be retained.

##### Copy tags from source

true

## Backup Policy Applied Resources:

The instances with the tag: Quest\_NP will be backed up with two schedules

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Stat
<input type="checkbox"/>	QA_PS_N2_06-Sep-24	i-0a17ddfc689bead8e	Running	t3.small	
<input type="checkbox"/>	QA_ICC_06-Sep-24	i-09f5a15ac820875d4	Running	r5.large	
<input type="checkbox"/>	QA_SI/PCM_N2_06-Sep-24	i-0f9cf23aebfa07eb2	Running	r5.large	
<input type="checkbox"/>	QA_PS_N1_06-Sep-24	i-06419d8ff7cf749ef	Running	t3.small	
<input type="checkbox"/>	QA_SI/PCM_N1_06-Sep-24	i-05731bd7c57759305	Running	r5.large	

## 2.4 Restore Process:

- Navigate to the Amazon Machine Image (AMI) and from the console click on Launch Instance from AMI so that it includes the location, image, data and boot snapshots from the Source Instance.

Amazon Machine Images (AMIs) (1/44) <a href="#">Info</a>				
<div> <input type="checkbox"/> Recycle Bin           <input type="checkbox"/> EC2 Image Builder           <div>Actions</div> <div>Launch instance from AMI</div> </div>				
<div>Owned by me</div> <div>Find AMI by attribute or tag</div>				
<input checked="" type="checkbox"/>	Name	AMI name	AMI ID	Source
<input checked="" type="checkbox"/>	Prod_PS1_06-Sep-24	DLM_policy-0b7660e5e66a1df99_i-03e249b4a27a...	ami-02a6bdf92fe1965b0	918536789691

Now we must write the Name of the server, SSH Key, Network Interface and rest of the components such as Image, Profile, Volumes and VPC are default included as same as the source Instance

**Launch an instance** [Info](#)

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

**Name and tags** [Info](#)

Name  
Quest\_Ability\_QA [Add additional tags](#)

**Application and OS Images (Amazon Machine Image)** [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images

[AMI from catalog](#) [Recents](#) [My AMIs](#) [Quick Start](#)

Amazon Machine Image (AMI)

**Number of instances** [Info](#)

1

**Software Image (AMI)**  
Created for policy: policy-Oda...[read more](#)  
ami-036d9ea594d6cce69

**Virtual server type (instance type)**  
t2.micro

**Firewall (security group)**  
New security group

**Storage (volumes)**  
2 volume(s) - 150 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month.

[Cancel](#) [Launch instance](#) [Review commands](#)

Below are the snips to create the server with the snapshots created as the consistency group, including volumes attached to the Virtual Instance.

**Configure storage** [Info](#) [Advanced](#)

1x 50 GiB gp2 Root volume (Not encrypted)

1x 100 GiB gp3 EBS volume (Not encrypted)

**Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage**

[Add new volume](#)

**Click refresh to view backup information**  
The tags that you assign determine whether the instance will be backed up by any Data Lifecycle Manager policies.

0 x File systems [Edit](#)

**Advanced details** [Info](#)

**Number of instances** [Info](#)

1

**Software Image (AMI)**  
Created for policy: policy-Oda...[read more](#)  
ami-036d9ea594d6cce69

**Virtual server type (instance type)**  
t2.micro

**Firewall (security group)**  
New security group

**Storage (volumes)**  
2 volume(s) - 150 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month.

[Cancel](#) [Launch instance](#) [Review commands](#)

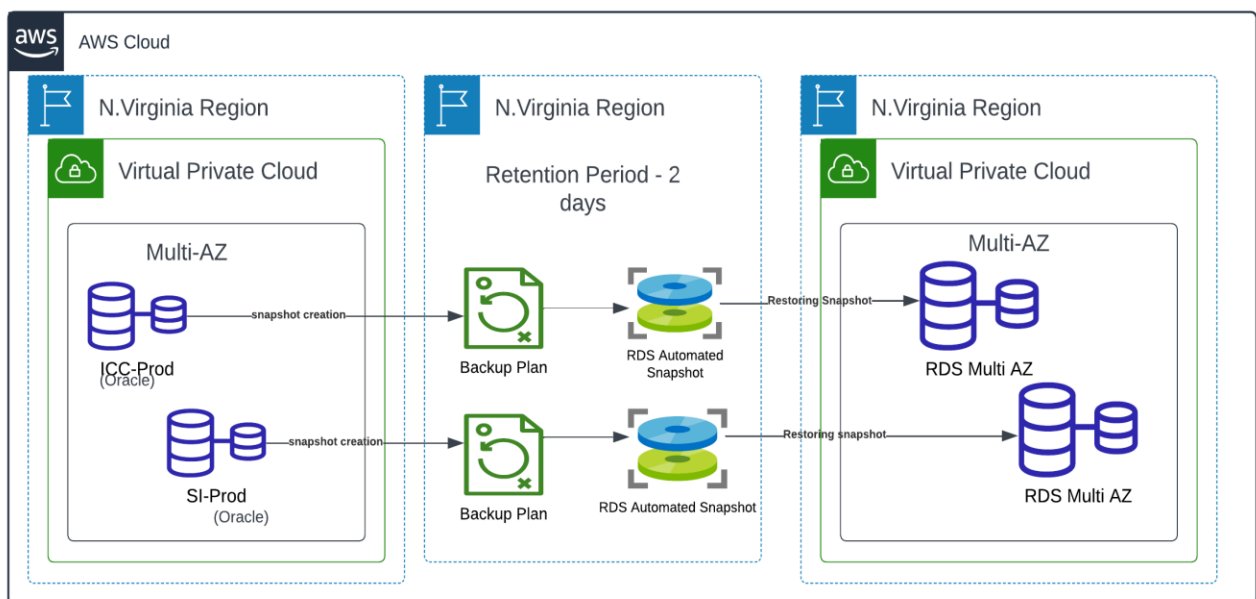
Now we must write the Name of the server, SSH Key, Network Interface and rest of the components such as Image, Profile, Volumes and VPC are default included as same as the source Instance.

**Note:** We have Included the Backup Policy for Production and Non-Production and the procedure for the backups to be taken.



## 3. RDS Database

### 3.1 RDS Database Backup Architecture



1. We have Two RDS (Oracle) in Quest Production environment Prod-ICC and SI-Prod with multi-AZ for high availability.
2. For both the databases Primary AZ will be US-east-1c and Secondary will be US-east-1b.
3. The RDS has an automatic backup method while launching the DB instance itself
4. We have enabled automatic backup in both the RDS.

- 5. Backup Frequency for ICC-Prod-DB: Every day at 09:16AM UTC.
- 6. Backup Frequency for SI-DB: Every day at 05:55AM UTC.

Backup Policy Retention	2 Days
Recovery Points	1 RDS
Replicas	Replicas across 2 Zones within the region.
Backup Process	Automatic, Manual Backups
Frequency	Every day at 05:55AM UTC.

3.2 RDS Database Backup Policy

Backup		
Automated backups Enabled (2 Days)	Latest restore time February 02, 2024, 16:26 (UTC+05:30)	Replicate to Region -
Copy tags to snapshots Enabled	Backup window 09:16-09:46 UTC (GMT)	Replicated automated backup -
Backup target AWS Cloud (US East (N. Virginia))		

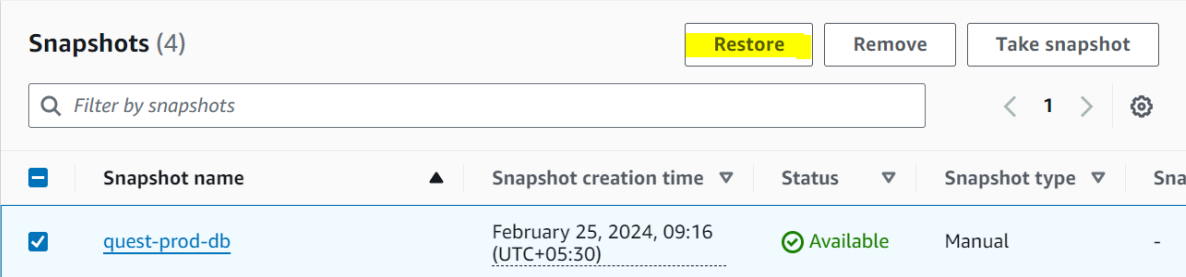
Below is the snip for Ongoing Backups of an RDS instance.

Filter by snapshots						< 1 > ⚙
<input type="checkbox"/>	Snapshot name ▲	Snapshot creation time ▼	Status ▼	Snapshot type ▼		
<input type="checkbox"/>	<a href="#">quest-prod-db</a>	February 25, 2024, 09:16 (UTC+05:30)	✔ Available	Manual	-	
<input type="checkbox"/>	<a href="#">rds:quest-prod-db-2024-02-25-06-03</a>	February 25, 2024, 11:33 (UTC+05:30)	✔ Available	Automated	-	
<input type="checkbox"/>	<a href="#">rds:quest-prod-db-2024-02-26-06-04</a>	February 26, 2024, 11:34 (UTC+05:30)	✔ Available	Automated	-	
<input type="checkbox"/>	<a href="#">rds:quest-prod-db-2024-02-27-06-03</a>	February 27, 2024, 11:33 (UTC+05:30)	✔ Available	Automated	-	

## 3.3 RDS Database Restore Process:

Database Name: Quest-prod-db

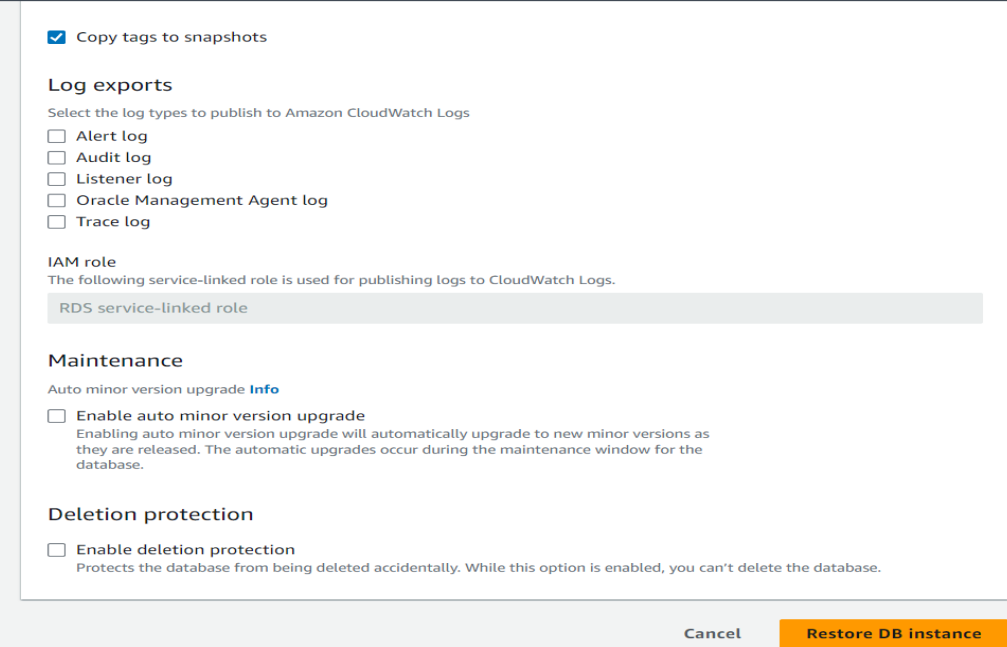
Select the Target DB and click on Backup and Maintenance then click on Restore.



The screenshot shows the 'Snapshots (4)' page in the Amazon RDS console. At the top, there are buttons for 'Restore' (highlighted in yellow), 'Remove', and 'Take snapshot'. Below these is a search bar labeled 'Filter by snapshots'. A table lists the snapshots with columns: Snapshot name, Snapshot creation time, Status, Snapshot type, and a 'Snapshots' column. One snapshot is listed: 'quest-prod-db' created on 'February 25, 2024, 09:16 (UTC+05:30)' with a status of 'Available' and a type of 'Manual'.

Snapshot name	Snapshot creation time	Status	Snapshot type	Snapshots
<a href="#">quest-prod-db</a>	February 25, 2024, 09:16 (UTC+05:30)	Available	Manual	-

Keep all the configurations as it is and click on Restore DB Instance.



The screenshot shows the 'Restore DB instance' configuration page. It includes several sections: 'Copy tags to snapshots' (checked), 'Log exports' (with checkboxes for Alert log, Audit log, Listener log, Oracle Management Agent log, and Trace log), 'IAM role' (showing 'RDS service-linked role'), 'Maintenance' (with 'Enable auto minor version upgrade' unchecked), and 'Deletion protection' (with 'Enable deletion protection' unchecked). At the bottom, there are 'Cancel' and 'Restore DB instance' buttons.

☒ Copy tags to snapshots

**Log exports**  
Select the log types to publish to Amazon CloudWatch Logs

- ☐ Alert log
- ☐ Audit log
- ☐ Listener log
- ☐ Oracle Management Agent log
- ☐ Trace log

**IAM role**  
The following service-linked role is used for publishing logs to CloudWatch Logs.

RDS service-linked role

**Maintenance**  
Auto minor version upgrade [Info](#)

- ☐ Enable auto minor version upgrade  
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

**Deletion protection**

- ☐ Enable deletion protection  
Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.

Cancel Restore DB instance

© 2024, Amazon Web Services, Inc. or its affiliates

## 3.4 Manual Backup Process in RDS

For taking the backup manually. We need to select the database. Go to the action, select take snapshot option

RDS > Databases > quest-prod-db

## quest-prod-db

**i** You can upgrade to Oracle Database 21c and higher only if your DB engine uses the previous version. To convert your database to multitenant architecture, choose **Modify** and then **Oracle Multitenant**.

### Summary

DB identifier quest-prod-db	Status <b>Available</b>	Role Instance	Engine Oracle Database 12c
CPU <div><div></div></div> 2.02%	Class db.r5.4xlarge	Current activity <div><div></div></div> 0.30 sessions	Edition Enterprise Edition
			Region us-east-1

- 
- Modify
- Actions ▲
- Quick Actions - New
- Convert to Multi-AZ deployment
  - Stop temporarily
  - Reboot
  - Delete
  - Set up EC2 connection
  - Set up Lambda connection
  - Take snapshot**
  - Restore to point in time
  - Migrate snapshot
  - Start database activity stream
  - Create ElastiCache cluster - new

### Preferences

To take a DB Snapshot, choose a DB Instance and name your DB Snapshot.

#### Snapshot type

- ☒ DB instance
- ☐ DB cluster

#### DB instance

DB Instance identifier. This is the unique key that identifies a DB Instance.

quest-prod-db ▼

#### Snapshot name

Identifier for the DB Snapshot.

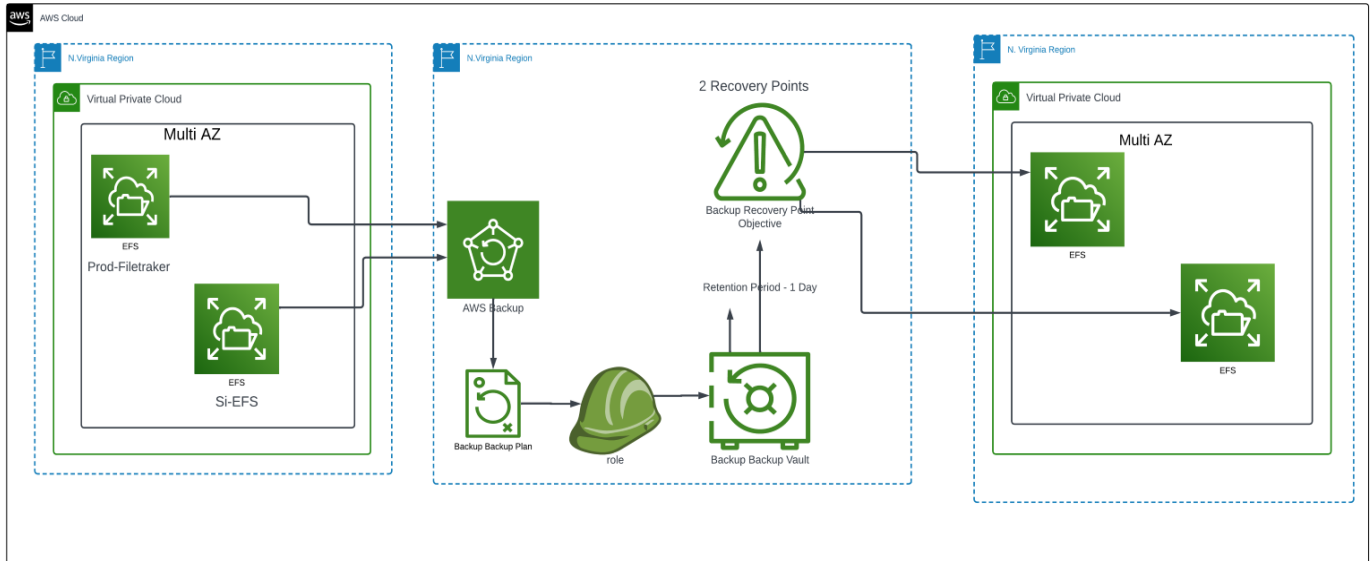
Snapshot identifier is case insensitive, but stored as all lower-case, as in "mysnapshot". Cannot be null, empty, or blank. Must contain from 1 to 255 alphanumeric characters or hyphens. First character must be a letter. Cannot end with a hyphen or contain two consecutive hyphens.

Cancel

Take snapshot











Select DB Instance , Click on take Snapshot to create a snapshot manually.

## 4. EFS PROD BACKUP ARCHITECTURE






1. We have two EFS in Quest Production Environment within regional type which is in N.Virginia, us east-1a, us east-1b and us east-1c
2. We have an AWS Backup service to create snapshots of EFS based on the configurations defined in Backup plan/rule and it uses an IAM role to have full access of EFS for snapshot creation. Once aws backup creates a snapshot it stores in Backup Vault as a Recovery point. From that Recovery point we can restore the EFS backup as required.
3. We can restore the EFS using recovery point as per our requirement for example, whole EFS or a particular path of EFS.
4. It has a single copy backup in N.Virginia
5. Backup Frequency: Every day at 5AM UTC.
6. Backup Retention: 1 Day

<b>Backup Policy Name</b>	aws/efs/automatic-backup-plan
<b>Applied Resources</b>	2 EFS
<b>Backup Plan Name</b>	aws/efs/automatic-backup-plan
<b>Retention Days</b>	1 Day
<b>Recovery Points</b>	1 EFS
<b>Frequency</b>	Every day at 5Am UTC

<input type="radio"/>	<a href="#">prod_file_tracker</a>	<a href="#">fs-04b4d26a6f11d8ea4</a>	 Encrypt d	136.07 GiB	131.48 GiB	4.58 GiB	-	-	 Available	Thu, 02/22/2022 17:19: GMT
<input type="radio"/>	<a href="#">PROD_EFS</a>	<a href="#">fs-d81d266d</a>	 Encrypt d	21.39 TiB	15.05 TiB	6.34 TiB	0 Bytes	-	 Available	Fri, 26/2021 11:46: GMT
<input type="radio"/>	<a href="#">NP_EFS</a>	<a href="#">fs-4e1e25fb</a>	 Encrypt d	3.55 TiB	655.34 GiB	2.91 TiB	0 Bytes	-	 Available	Fri, 26/2021 11:45: GMT
<input type="radio"/>	<a href="#">Non_Prod_Jarvis</a>	<a href="#">fs-35ad9180</a>	 Encrypt d	6.00 KiB	6.00 KiB	0 Bytes	0 Bytes	-	 Available	Wed, 2/2021 17:11: GMT
<input type="radio"/>	<a href="#">Prod_Jarvis</a>	<a href="#">fs-a004b557</a>	 Encrypt d	6.00 KiB	6.00 KiB	0 Bytes	0 Bytes	-	 Available	Tue, 2/2021 15:31: GMT

- The Quest Prod EFS is highly available in 3 availability zones: us-east-1a, us-east-1b and us-east-1c

Metered size	Monitoring	Tags	File system policy	Access points	Network	Replication
<b>Network</b> <span>Manage</span>						
Availability zone ▲	Mount target ID ▼	Subnet ID ▼	Mount target state ▼	IP address ▼	Network interface ID ▼	Security groups ▼
us-east-1a	fsmt-78986bcd	subnet-00f52bf1d968ff77c	 Available	10.166.33.104	eni-0d42cfe3a6886ba5b	sg-0566764a497f62 (prod_EFS)
us-east-1b	fsmt-7a986bcf	subnet-03c96ea55f48285e2	 Available	10.166.33.85	eni-0cd55921a541a77f9	sg-0566764a497f62 (prod_EFS)
us-east-1c	fsmt-7e986bcb	subnet-07f64b724d6331b6d	 Available	10.166.33.44	eni-04cf491dd115f0ab9	sg-0566764a497f62 (prod_EFS)

## 4.1 EFS backup Policy

We have AWS Backup plan for automatic backup of EFS which takes backup of file share with frequency of every day

**Backup plans (1)** [Info](#) Create on-demand backup Create backup plan

Backup plans define your backup requirements, including backup schedules, backup retention rules and lifecycle rules.

Find backup plan by name  Filter tag key  Filter tag value  < 1 > ⚙️

Backup plan name	Last runtime	Last modified
<a href="#">aws/efs/automatic-backup-plan</a>	February 27, 2024, 12:17:16 (UTC+05:30)	March 22, 2022, 18:44:18 (UTC+05:30)

## 4.2 Restore EFS from AWS Backup Vault

Go to AWS Backup--> Backup Vaults

**Backup vaults (1)** [Info](#) Create backup vault

Backup vaults are containers where your backups are stored. You can have one default vault or multiple vaults where backups can be stored.

Search by vault name or vault lock status  Filter tag key  Filter tag value  < 1 > ⚙️

Backup vault name	Vault lock status	Recovery points	KMS encryption key ID
<a href="#">aws/efs/automatic-backup-vault</a>	-	3	<a href="#">2e18f6d0-a3ec-4ab9-b64a-bcd1bcd572</a>

Select the backup vault where you have the EFS backups stored.

**Recovery points (3)** [Info](#) ↺ Deselect all Actions

Filter by resource type, recovery point ID, status, resource ID or source account ID  < 1 > ⚙️

<input type="checkbox"/>	Recovery point ID	Status	Resource name	Resource ID
<input type="checkbox"/>	<a href="#">5be73b01-146d-477b-9ce3-bed03353bf54</a>	✔️ Completed	PROD_EFS	file-system/fs-d81d266d
<input type="checkbox"/>	<a href="#">14c5dfc4-1652-4857-aafe-0f17921c527a</a>	✔️ Completed	NP_EFS	file-system/fs-4e1e25fb
<input type="checkbox"/>	<a href="#">61e98c1f-6ec3-4cb5-940e-34c0e65ad096</a>	✔️ Completed	prod_file_tracker	file-system/fs-04b4d26a6f11

Select the latest recovery point.

**Recovery points (1/3)** [Info](#)

Deselect all

**Actions** ▲

Copy
Edit
Restore
Delete

Filter by resource type, recovery point ID, status, resource ID or source account ID

	Recovery point ID	Status	Resource name	Resource
<input checked="" type="checkbox"/>	<a href="#">5be73b01-146d-477b-9ce3-bed03353bf54</a>	Completed	PROD_EFS	file-system, prod-efs

Select the restore type and other required settings --> Restore Backup.

**Restore role** [Info](#)

Specify the IAM role that AWS Backup will assume when restoring the backup.

☒ Default role

If the AWS Backup default role is not present, one will be created for you with the correct permissions.

☐ Choose an IAM role

**Protected resource tags** [Info](#)

☒ Copy tags from the protected resource to the restored resource

Cancel
Restore backup