

TASK 3.1P

CLOUD COMPUTING

Introducing Amazon Elastic File System

Task 1: Creating a security group to access your EFS file system

The screenshot displays the AWS Management Console interface. The top navigation bar shows the user is logged in as 'voclabs/user3904332=s224001588@deakin.edu.au' in the 'United States (N. Virginia)' region. The left-hand navigation menu is expanded to 'EC2', showing options like Dashboard, EC2 Global View, Events, Instances, Images, and Elastic Block Store. The main content area shows the 'EC2' dashboard with a 'Resources' section listing various EC2 resources. Below this, there are sections for 'Launch instance' and 'Service health'. The bottom section of the dashboard shows 'Security Groups (3)' with a table listing three security groups: 'default' (VPC ID: vpc-0aabdb12b719ce7b3), 'default' (VPC ID: vpc-02c63f6f0e25667cb), and 'EFSClient' (VPC ID: vpc-02c63f6f0e25667cb). The 'EFSClient' security group is highlighted.

Resources

Resource	Count
Instances (running)	1
Dedicated Hosts	0
Key pairs	1
Security groups	3
Auto Scaling Groups	0
Elastic IPs	1
Load balancers	0
Snapshots	0
Capacity Reservations	0
Instances	1
Placement groups	0
Volumes	1

Launch instance

To get started, launch an Amazon EC2 Instance, which is a virtual server in the cloud.

[Launch instance](#)

[Migrate a server](#)

Note: Your instances will launch in the United States (N. Virginia) Region

Service health

[AWS Health Dashboard](#)

Region: United States (N. Virginia)

Status: ✔ This service is operating normally.

Zones

Security Groups (3)

Name	Security group ID	Security group name	VPC ID	Description
-	sg-087f5578ed06048f7	default	vpc-0aabdb12b719ce7b3	default VPC sec.
-	sg-0e496d3e5b2beeb044	default	vpc-02c63f6f0e25667cb	default VPC sec.
EFSClient	sg-0dd1513d9dbffac39	EFSClient	vpc-02c63f6f0e25667cb	EFS Client

The screenshot displays the AWS Management Console interface, showing the process of creating and viewing a security group.

Top Section: Create security group

- Basic details:**
 - Security group name:** EFS Mount Target
 - Description:** Inbound NFS access from EFS clients
 - VPC:** vpc-02c63f6f0e25667cb (Lab VPC)
- Inbound rules:** This security group has no inbound rules. [Add rule](#)
- Outbound rules:** [Add rule](#)

Bottom Section: sg-079387d0cdc118ed3 - EFS Mount Target

- Details:**
 - Security group name:** EFS Mount Target
 - Security group ID:** sg-079387d0cdc118ed3
 - Description:** Inbound NFS access from EFS clients
 - VPC ID:** vpc-02c63f6f0e25667cb
 - Owner:** 106982772542
 - Inbound rules count:** 1 Permission entry
 - Outbound rules count:** 1 Permission entry
- Inbound rules (1):**

Name	Security group rule ID	IP version	Type	Protocol	Port range
-	sgr-07f7da9067a8faa2a	-	NFS	TCP	2049

Task 2: Creating an EFS file system

The screenshot shows the Amazon Elastic File System (EFS) console page. The browser's address bar displays the URL: `us-east-1.console.aws.amazon.com/efs/home?region=us-east-1#/get-started`. The page features a dark blue header with the AWS logo and navigation links. A left-hand sidebar contains the 'Elastic File System' menu, with sub-items: 'File systems', 'Access points', 'AWS Backup', 'AWS DataSync', 'AWS Transfer', and 'Documentation'. The main content area has a large heading 'Amazon Elastic File System' followed by the subheading 'Scalable, elastic, cloud-native NFS file system'. Below this, a brief description states: 'Amazon Elastic File System (Amazon EFS) provides a simple, scalable, elastic file system for general purpose workloads for use with AWS Cloud services and on-premises resources.' To the right of the main heading is a 'Create file system' button. Below the main heading is a 'What is Amazon Elastic File System?' section, which includes a video player thumbnail titled 'Amazon Elastic File System - Scalable, Ela...'. To the right of the video player is a 'Pricing' section that explains the pay-as-you-go model and provides links to the 'AWS Pricing Calculator' and 'Learn more about pricing'. The bottom of the page shows the Windows taskbar with various application icons and the system clock indicating 19:11 on 27-03-2025.

OnTrack

us-east-1

Online Notepad

us-east-1.console.aws.amazon.com/efs/home?region=us-east-1#/get-started

aws

Services

[Alt+S]

United States (N. Virginia)

voclabs/user:3904332=s224001588@deakin.edu.au @ 1059-8277-2542

Elastic File System

File systems

Access points

AWS Backup

AWS DataSync

AWS Transfer

Documentation

Amazon Elastic File System

Scalable, elastic, cloud-native NFS file system

Amazon Elastic File System (Amazon EFS) provides a simple, scalable, elastic file system for general purpose workloads for use with AWS Cloud services and on-premises resources.

Create file system

Create an EFS file system with recommended settings.

Create file system

What is Amazon Elastic File System?

Amazon Elastic File System - Scalable, Ela...

Pricing

With EFS, there are no minimum fees. You pay only for the storage that you use, the data that you read and write, and any additional throughput that you provision.

Estimate your cost using the [AWS Pricing Calculator](#)

[Learn more about pricing](#)

CloudShell

Feedback

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Sports headline
Red Bull are set L...

Search

ENG
IN

19:11
27-03-2025

The screenshot displays the Amazon EFS 'Create a file system' console. The browser address bar shows the URL: `us-east-1.console.aws.amazon.com/efs/home?region=us-east-1#/file-systems/create?name=&vpc=vpc-0aabbdb12b719ce7b3`. The console is divided into two main sections: 'File system settings' and 'Lifecycle management'.

File system settings

- General**
 - Name - optional**: Name your file system.
 - File system type**: Choose to either store data across multiple Availability Zones or within a single Availability Zone. [Learn more](#)
 - ☒ **Regional**: Offers the highest levels of availability and durability by storing file system data across multiple Availability Zones within an AWS Region.
 - ☐ **One Zone**: Provides continuous availability to data within a single Availability Zone within an AWS Region.
 - Automatic backups**: Automatically backup your file system data with AWS Backup using recommended settings. Additional pricing applies. [Learn more](#)
 - ☐ **Enable automatic backups**

Lifecycle management

Automatically save money as access patterns change by moving files into the Infrequent Access (IA) or Archive storage class. [Learn more](#)

Transition into Infrequent Access (IA)	Transition into Archive	Transition into Standard
Transition files to IA based on the time since they were last accessed in Standard storage. <input type="text" value="None"/>	Transition files to Archive based on the time since they were last accessed in Standard storage. <input type="text" value="90 day(s) since last access"/>	Transition files back to Standard storage based on when they are first accessed in IA or Archive storage. <input type="text" value="None"/>

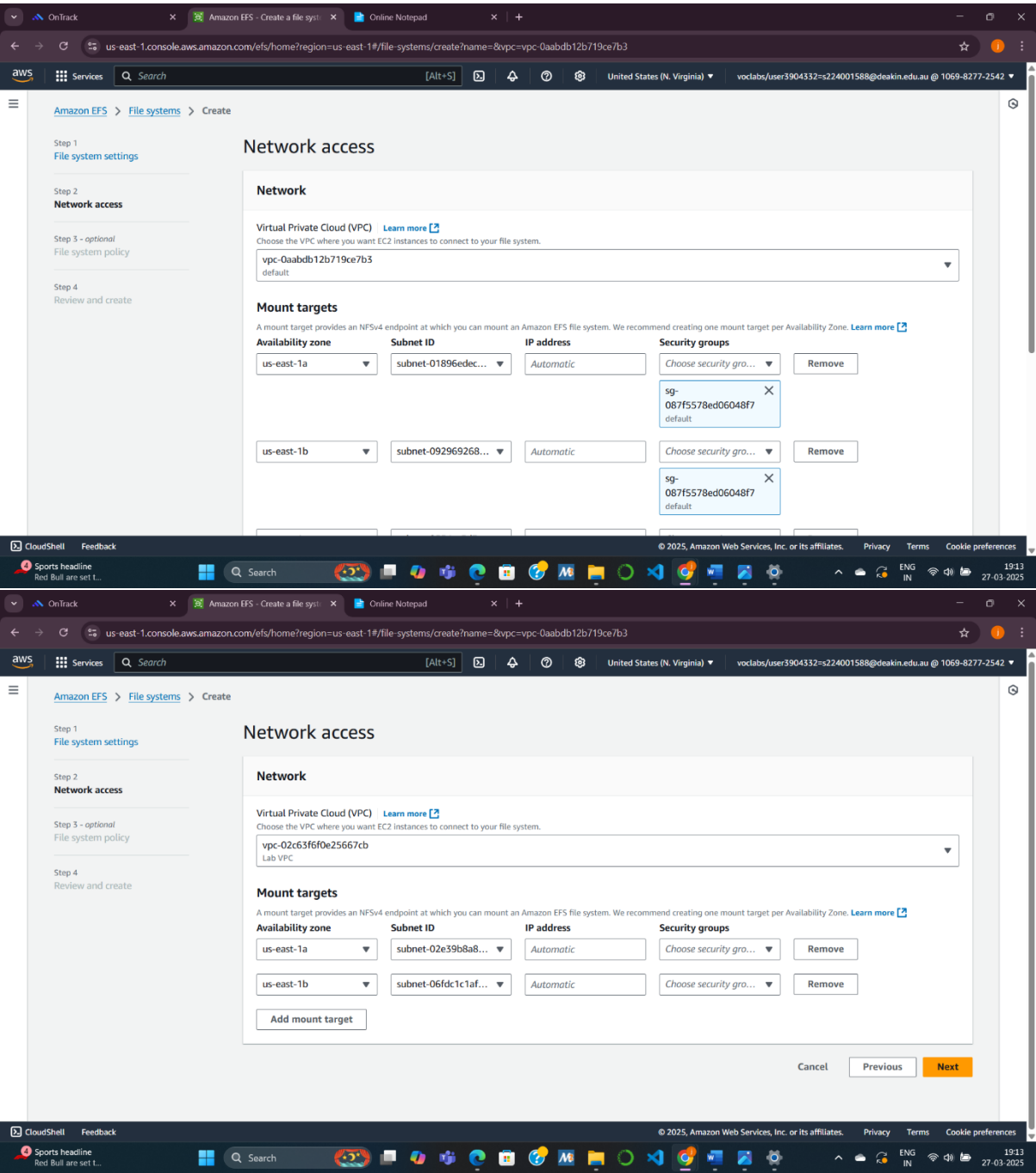
Encryption

Choose to enable encryption of your file system's data at rest. Uses the AWS KMS service key (aws/elasticfilesystem) by default. [Learn more](#)

- ☒ **Enable encryption of data at rest**

[Customize encryption settings](#)

Performance settings



Step 1: File system settings

File system

Field	Value	Is editable?
Name	-	Yes
Performance mode	General Purpose	No
Throughput mode	Elastic	Yes
Encrypted	Yes	No
KMS Key ID	-	No
Lifecycle management	Transition into Infrequent Access (IA): None Transition into Archive: 90 day(s) since last access Transition into Standard: None	Yes
Automatic backups	No	Yes
VPC ID	vpc-02c63f6f0e25667cb (Lab VPC)	Yes
Availability Zone	Regional	No

Tags

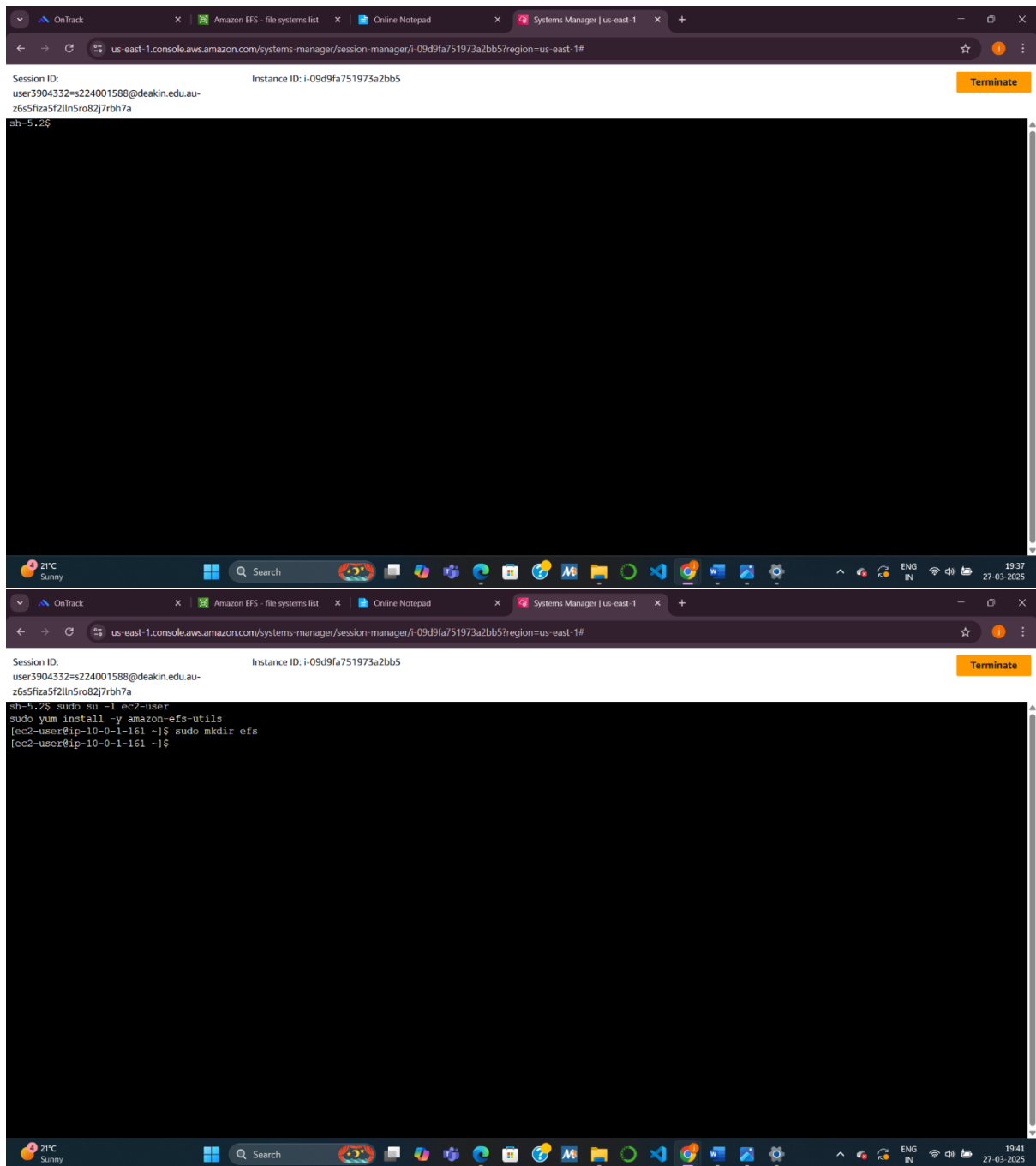
Elastic File System

File systems (1)

Filter by property values

Name	File system ID	Encrypted	Total size	Size in Standard	Size in IA	Size in Archive	Provisioned Throughput (MiB/s)
My First EFS File System	fs-0c004fcd167da6bcb	Encrypted	0 Bytes	0 Bytes	0 Bytes	0 Bytes	-

Task 3: Connecting to your EC2 instance



Task 4: Creating a new directory and mounting the EFS file system

The screenshot shows the AWS Management Console interface for an Elastic File System (EFS). The browser tabs include 'OnTrack', 'Amazon EFS - File system confi...', 'Online Notepad', and 'Systems Manager | us-east-1'. The address bar shows the URL: `us-east-1.console.aws.amazon.com/efs/home?region=us-east-1#/file-systems/fs-0c004fcd167da6bcb`. The console header shows the AWS logo, 'Services', a search bar, and the region 'United States (N. Virginia)'. The user profile is 'voclabs/user3904332=s224001588@deakin.edu.au @ 1059-8277-2542'.

The left sidebar shows the 'Elastic File System' section with links to 'File systems', 'Access points', 'AWS Backup', 'AWS DataSync', 'AWS Transfer', and 'Documentation'. The main content area displays the details for 'My First EFS File System (fs-0c004fcd167da6bcb)' with buttons for 'Delete', 'Attach', and 'Edit'.

The 'General' tab shows the following information:

- Amazon resource name (ARN):** `arn:aws:elasticfilesystem:us-east-1:106982772542:file-system/fs-0c004fcd167da6bcb`
- Automatic backups:** Disabled
- Encrypted:** `c561222b-7729-4f79-be3a-49d46cc042a8 (aws/elasticfilesystem)`
- File system state:** Available
- DNS name:** `fs-0c004fcd167da6bcb.efs.us-east-1.amazonaws.com`
- Replication overwrite protection:** Enabled
- Performance mode:** General Purpose
- Throughput mode:** Elastic
- Lifecycle management:**
 - Transition into Infrequent Access (IA): None
 - Transition into Archive: None
 - Transition into Standard: None
- Availability zone:** Regional

The screenshot shows the AWS Systems Manager console. The browser tabs include 'OnTrack', 'Amazon EFS - File system confi...', 'Online Notepad', and 'Systems Manager | us-east-1'. The address bar shows the URL: `us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-09d9fa751973a2bb5?region=us-east-1#`. The console header shows the AWS logo, 'Services', a search bar, and the region 'United States (N. Virginia)'. The user profile is 'voclabs/user3904332=s224001588@deakin.edu.au @ 1059-8277-2542'.

The left sidebar shows the 'Systems Manager' section with links to 'Sessions', 'Instances', 'Targets', 'Policies', 'Parameters', 'Scripts', 'Plugins', 'Tools', and 'Help'. The main content area displays the details for a session with an EC2 instance. The session ID is 'user3904332=s224001588@deakin.edu.au-z655fza5f2lin5ro82j7rbh7a' and the instance ID is 'i-09d9fa751973a2bb5'. There is a 'Terminate' button.

The terminal window shows the following commands and output:

```
sh-5.2$ sudo su -i ec2-user
sudo yum install -y amazon-efs-utils
[ec2-user@ip-10-0-1-161 ~]$ sudo mkdir efs
[ec2-user@ip-10-0-1-161 ~]$ sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsz=1048576,hard,timeo=600,retrans=2,noresvport fs-0c004fcd167da6bcb.efs.us-east-1.amazonaws.com:/ efs
[ec2-user@ip-10-0-1-161 ~]$
```


The screenshot displays a terminal window within an AWS Systems Manager session. The terminal shows the following commands and output:

```
sh-5.2$ sudo su -l ec2-user
sudo yum install -y amazon-efs-utils
[ec2-user@ip-10-0-1-161 ~]$ sudo mkdir efs
[ec2-user@ip-10-0-1-161 ~]$ sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-0c004fcd167da6bcb.efs.us-east-1.amazonaws.com:/ efs
[ec2-user@ip-10-0-1-161 ~]$ sudo df -hT
```

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
devtmpfs	devtmpfs	4.0M	0	4.0M	0%	/dev
tmpfs	tmpfs	475M	0	475M	0%	/dev/shm
tmpfs	tmpfs	190M	452K	190M	1%	/run
/dev/xvda1	xfs	8.0G	1.6G	6.4G	20%	/
tmpfs	tmpfs	475M	0	475M	0%	/tmp
/dev/xvda128	vfat	10M	1.3M	8.7M	13%	/boot/efi
tmpfs	tmpfs	95M	0	95M	0%	/run/user/0
fs-0c004fcd167da6bcb.efs.us-east-1.amazonaws.com:/	nfs4	8.0E	0	8.0E	0%	/home/ec2-user/efs

```
[ec2-user@ip-10-0-1-161 ~]$
```

The second screenshot shows the continuation of the terminal session, including the execution of the `df` command and the `io` benchmark tool:

```
[ec2-user@ip-10-0-1-161 ~]$ sudo df -hT
[ec2-user@ip-10-0-1-161 ~]$ sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2,noresvport fs-0c004fcd167da6bcb.efs.us-east-1.amazonaws.com:/ efs
[ec2-user@ip-10-0-1-161 ~]$ sudo df -hT
[ec2-user@ip-10-0-1-161 ~]$ sudo fio --name=fio-efs --filesize=10G --filename=/efs/fio-efs-test.img --bs=1M --nrfiles=1 --direct=1 --sync=0 --rw=write --iodepth=200 --ioengine=libaio
fio-efs: (g=0): rw=write, bs=(R) 1024KiB-1024KiB, (W) 1024KiB-1024KiB, (T) 1024KiB-1024KiB, ioengine=libaio, iodepth=200
fio-3.32
Starting 1 process
fio-efs: Laying out 10 file (1 file / 10240MiB)
jobs: 1 (f=1): [W(1)][30.6%][w=120MiB/s][w=120 IOPS][eta 00m:59s]
```

Task 5: Examining the performance behavior of your new EFS file system

The screenshot shows the AWS CloudWatch Overview page in a web browser. The browser tabs include OnTrack, CloudWatch | us-east-1, Online Notepad, and Systems Manager | us-east-1. The address bar shows the URL: us-east-1.console.aws.amazon.com/cloudwatch/home?region=us-east-1#home. The page header includes the AWS logo, a search bar, and user information: United States (N. Virginia) and voclabs/user3904332=s224001588@deakin.edu.au @ 1059-8277-2542. The left sidebar contains navigation links for CloudWatch, Favorites and recents, Dashboards, AI Operations, Alarms, Logs, Metrics, X-Ray traces, Events, Application Signals, Network Monitoring, Insights, and Settings. The main content area is titled 'Overview' and includes a 'Get started with CloudWatch' section with four cards: 'Set alarms on any of your metrics', 'Create and name any CloudWatch dashboard', 'Monitor using your existing system', and 'Write rules to indicate which events'. Below this is a 'Get started with Observability solutions' section with three cards: 'Reliable observability solutions', 'Available in Amazon native and open-source platforms', and 'Simplify the process of instrumenting and gaining insights'. The bottom of the page shows a Windows taskbar with various application icons and a system clock showing 19:48 on 27-03-2025.

The screenshot shows the AWS CloudWatch Metrics page. The browser tabs are the same as the previous screenshot. The address bar shows the URL: us-east-1.console.aws.amazon.com/cloudwatch/home?region=us-east-1#metricsV2?graph=-(view--timeSeries--stacked--false--metrics--(-AWS*2IFS--PermittedThroughput--fs-0e48...). The page header is similar to the previous screenshot. The left sidebar is the same. The main content area is titled 'Untitled graph' and includes a 'Browse' tab, a 'Multi source query' tab, and a 'Graphed metrics (1)' table. The table has columns for 'Source', 'Options', and 'Source'. The 'Source' column lists several metrics, including 'ClientConnections', 'TotalIOBytes', 'MetadataWriteIOBytes', 'MetadataIOBytes', 'MeteredIOBytes', 'PercentIOLimit', and 'PermittedThroughput'. The 'PermittedThroughput' metric is selected. The 'Options' column for all metrics shows 'No alarms'. The 'Source' column for 'PermittedThroughput' shows 'fs-0e486af5a5f61ffa7'. The bottom of the page shows a Windows taskbar with various application icons and a system clock showing 19:50 on 27-03-2025.

Guided lab: Introducing Amazon Elastic File System (Amazon EFS)

Due No Due Date Points 15 Submitting an external tool

00:54 Start Lab End Lab AWS Details Details

EN_US

The throughput that is available to a file system scales as a file system grows. All file systems deliver a consistent baseline performance of 50 MiB/s per TiB of storage. Also, all file systems (regardless of size) can burst to 100 MiB/s. File systems that are larger than 1 TiB can burst to 100 MiB/s per TiB of storage. As you add data to your file system, the maximum throughput that is available to the file system scales linearly and automatically with your storage.

File system throughput is shared across all EC2 instances that are connected to a file system. For more information about performance characteristics of your

Total score 15/15

[Task 1] Security Group created 5/5

[Task 2] EFS file system created 5/5

[Task 5] Flexible IO was run 5/5

Submission

Mar 26 at 3:33pm

[Submission Details](#)

Grade: 10 (15 pts possible)

Graded Anonymously: no

Comments: No Comments

KNOWLEDGE CHECK :

Module 5 Knowledge Check

Due No Due Date Points 100 Submitting an external tool

00:54 Start Lab End Lab AWS Details Details

EN_US

KEYBOARD NAVIGATION

Knowledge check results

Your score: 90% (90 points)

Required score: 70% (70 points)

Result: Congratulations! You have completed this knowledge check.

To continue, choose **Next** in the lower-right corner.

Submission

Mar 27 at 9:20am

[Submission Details](#)

Grade: 80 (100 pts possible)

Graded Anonymously: no

Comments: No Comments