

AWS-Elastic FILE SYSTEMS

Amazon Elastic File System (Amazon EFS)

EFS provides simple, scalable, elastic [file storage](#) for use with AWS cloud services and on-premises resources. Amazon EFS is built to elastically scale on demand without disrupting applications, growing and shrinking automatically as you add and remove files, so your applications have the storage they need, when they need it.

Amazon EFS is a regional service designed for high availability and durability supporting a broad spectrum of use cases, including web serving and content management, enterprise applications, media and entertainment processing workflows, home directories, database backups, developer tools, container storage, and big data analytics workloads.

How it works:

When mounted on amazon EC2 instances, an amazon EFS file system provides a standard file system interface and file system access semantics, allowing you to seamlessly integrate amazon EFS with your existing applications and tools. Multiple amazon EC2 instances can access an amazon EFS file system at the same time, allowing amazon EFS to provide a common data source for workloads and applications running on more than one amazon EC2 instance.

You can mount your amazon EFS file systems on your on-premises datacenter servers when connected to your amazon VPC with [AWS direct connect](#). You can mount your EFS file systems on on-premises servers to migrate data sets to EFS, enable cloud bursting scenarios, or backup your on-premises data to EFS.

Benefits:

- ❖SIMPLE
- ❖SHARED FILE STORAGE
- ❖SEAMLESS INTEGRATION
- ❖AUTOMATICALLY SCALES
- ❖SCALEABLE PERFORMANCE
- ❖LOW COST
- ❖HIGHLY AVAILABLE AND DURABLE
- ❖OPTIMIZED TRANSFERS
- ❖SECURE

Use cases:

- **Enterprise applications:** Amazon EFS provides the scalability, elasticity, availability, and durability to be the file store for enterprise applications and for applications delivered as a service. Its standard file system interface and file system semantics make it easy to migrate enterprise applications to the AWS cloud or to build new ones.
- **Media & entertainment workflows:** Media workflows like video editing, studio production, broadcast processing, sound design, and rendering often depend on shared storage to manipulate large files. Strong data consistency model with high throughput and shared file access can cut the time it takes to perform these jobs and consolidate multiple local file repositories into a single location for all users.
- **Analytics:** Amazon EFS provides the scale and performance required for big data applications that require high throughput to compute nodes coupled with read-after-write consistency and low-latency file operations. Many analytics workloads interact with data via a file interface, rely on file semantics such as file locks, and require the ability to write to portions of a file. Amazon EFS supports the needed file systems semantics and can scale capacity as well as performance.

Use cases:

- **Home directories:** Amazon EFS can provide storage for organizations that have many users that need to access and share common data sets. An administrator can use Amazon EFS to create a file system accessible to individuals across an organization and establish permissions for users and groups at the file or directory level.
- **Content management & web serving:** Amazon EFS can be used as a durable, high throughput file system for content management systems and web serving applications that store and serve information for a range of applications like web sites, online publications, and archives. Since Amazon EFS adheres to the expected file system semantics, file naming conventions, and permissions that web developers are accustomed to, it can easily integrate with web applications and can be used for a range of applications like web sites, online publications, and archives.

Use cases:

- **Software development tools:** Amazon EFS enables your organization to be more agile and responsive to customer needs. Provision, duplicate, scale, or archive your development, test, and production environments with a few clicks. With the ability to share code and other files in an organized way, shared cloud file storage with EFS provides an organized and secure repository that is easily accessible within their cloud development environments. Amazon EFS delivers a scalable and highly available solution that is ideal for testing and development workloads.
- **Database backups :** Amazon EFS presents a standard file system that can be easily mounted from database servers. They can be an ideal platform to create portable database backups using native application tools or enterprise backup applications. Many businesses want to take advantage of the flexibility of storing database backups in the cloud either for temporary protection during updates or for development and test.

Use cases:

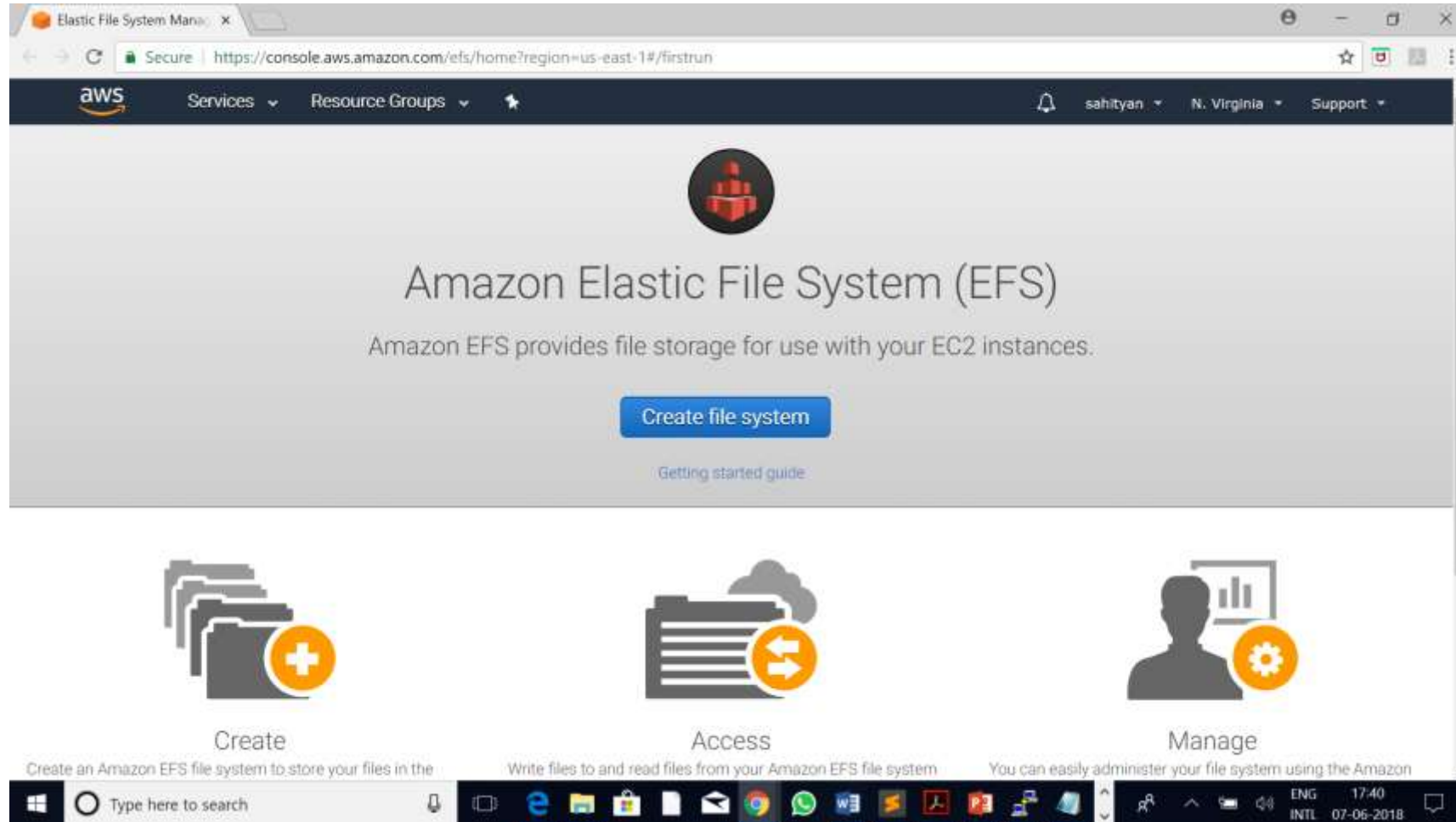
- **Container storage:** Containers are ideal for building microservices because they're quick to provision, easily portable, and provide process isolation. Containers that need access to the original data each time they start, require a shared file system that they can connect to regardless of which instance they're running on. Amazon efs provides persistent shared access to file data, which is ideal for container storage

LAB:

1. Create EC2 INSTANCES
2. Download , Install & Config httpd webserver
3. Create Load Balancer and attach to the EC2 instances
4. Code a index.html and deploy
5. Go to browse & check the website status
6. Create EFS & Mount on EC2 instance & Create index.html on document root(/var/www/html)

Creating Elastic File Systems

Step 1: Services → Storage → EFS



Click on “Create file system”

Step 2: Select the default VPC and Click on “Next Step” & Add Server to security group

Step 1: Configure file system access

Step 2: Configure optional settings

Step 3: Review and create

Configure file system access

An Amazon EFS file system is accessed by EC2 instances running inside one of your VPCs. Instances connect to a file system by using a network interface called a mount target. Each mount target has an IP address, which we assign automatically or you can specify.

VPC: vpc-86707cfe (default)

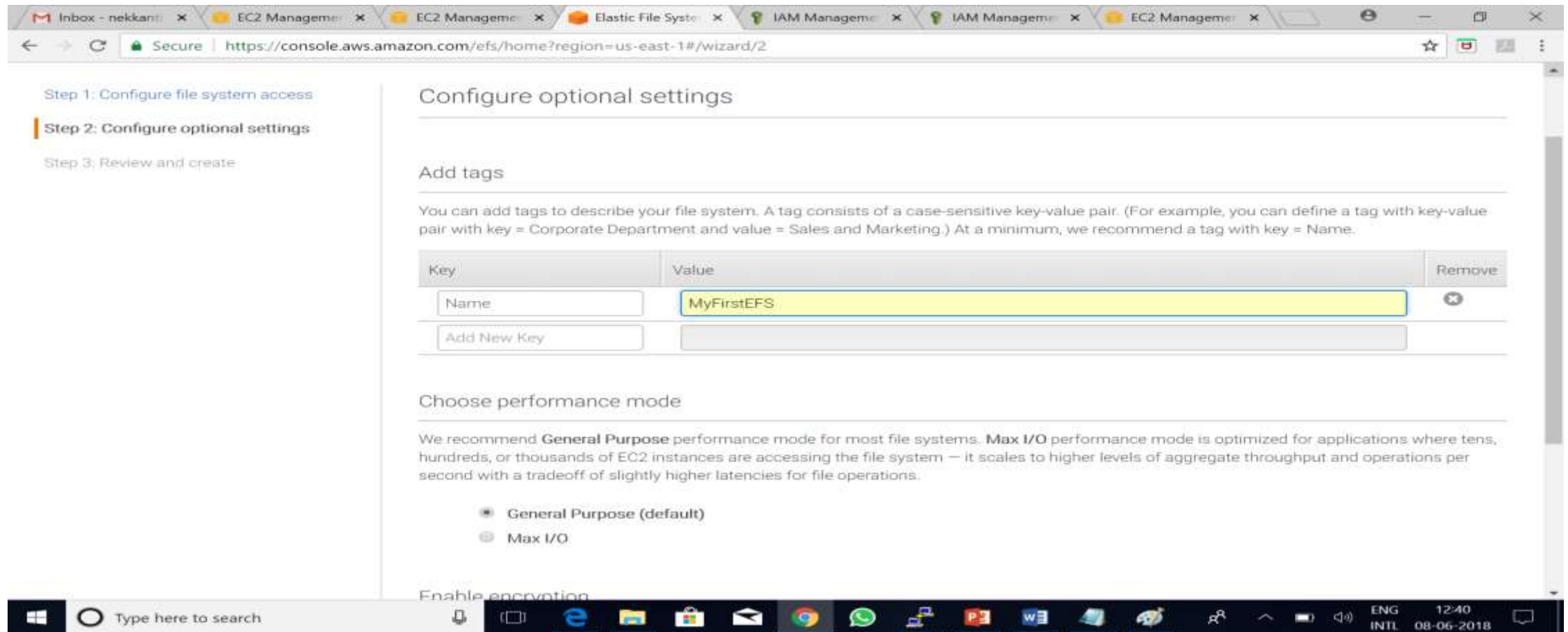
Create mount targets

Instances connect to a file system by using mount targets you create. We recommend creating a mount target in each of your VPC's Availability Zones so that EC2 instances across your VPC can access the file system.

| | Availability Zone | Subnet | IP address | Security groups |
|-------------------------------------|-------------------|--|------------|---|
| <input checked="" type="checkbox"/> | us-east-1a | subnet-a56049ee (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| <input checked="" type="checkbox"/> | us-east-1b | subnet-d43e5a89 (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| <input checked="" type="checkbox"/> | us-east-1c | subnet-2f0e564b (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |


Click on “Next”

Step 3: Configure optional setting by providing tag's



The screenshot displays the AWS Management Console interface for configuring an Elastic File System (EFS). The browser address bar shows the URL: <https://console.aws.amazon.com/efs/home?region=us-east-1#wizard/2>. The left sidebar indicates the current step is 'Step 2: Configure optional settings'. The main content area is titled 'Configure optional settings' and includes the following sections:

- Add tags**: A section explaining that tags are case-sensitive key-value pairs. A table below shows a single tag added:

| Key | Value | Remove |
|-------------|------------|---|
| Name | MyFirstEFS |  |
| Add New Key | | |
- Choose performance mode**: A section explaining the two performance modes. The 'General Purpose (default)' mode is selected with a radio button.
 - ☒ General Purpose (default)
 - ☐ Max I/O
- Enable encryption**: This section is partially visible at the bottom of the screenshot.

The Windows taskbar at the bottom shows the system clock as 12:40 on 08-06-2018, with the language set to ENG INTL.

☒ General Purpose (default)

☐ Max I/O

Enable encryption

If you enable encryption for your file system, all data on your file system will be encrypted at rest. You can select a KMS key from your account to protect your file system, or you can provide the ARN of a key from a different account. Encryption of data at rest can only be enabled during file system creation. Encryption of data in transit is configured when mounting your file system. [Learn more](#)

☐ Enable encryption of data at rest

[Cancel](#)

[Previous](#)

[Next Step](#)

Click on “Next step”

Step 4: Review and Create

The screenshot shows the AWS Management Console interface for creating an Elastic File System (EFS). The browser tabs at the top include 'Inbox - nekkanti', 'EC2 Management', 'Elastic File System', 'IAM Management', and 'EC2 Management'. The address bar shows the URL 'https://console.aws.amazon.com/efs/home?region=us-east-1#/wizard/3'. The left sidebar contains navigation links for 'Step 1: Configure file system access', 'Step 2: Configure optional settings', and 'Step 3: Review and create'. The main content area is titled 'Review and create' and includes a sub-header 'File system access'. Below this, a table lists the configuration details for the file system access. The table has five columns: VPC, Availability Zone, Subnet, IP address, and Security groups. The VPC is 'vpc-86707cfe (default)'. The Availability Zones are 'us-east-1a', 'us-east-1b', 'us-east-1c', 'us-east-1d', 'us-east-1e', and 'us-east-1f'. The Subnets are 'subnet-a56049ee (default)', 'subnet-d43e5a89 (default)', 'subnet-2f0e564b (default)', 'subnet-4a721265 (default)', 'subnet-e10770de (default)', and 'subnet-7aee1d75 (default)'. The IP address is 'Automatic'. The Security groups are 'sg-1f1f336b - default' and 'sg-26dfc76e - Server'. Below the table, there is a section for 'Optional settings'.

Step 1: Configure file system access

Step 2: Configure optional settings

Step 3: Review and create

Review and create

Review the configuration below before proceeding to create your file system.

File system access

| VPC | Availability Zone | Subnet | IP address | Security groups |
|------------------------|-------------------|---------------------------|------------|---|
| vpc-86707cfe (default) | us-east-1a | subnet-a56049ee (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| | us-east-1b | subnet-d43e5a89 (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| | us-east-1c | subnet-2f0e564b (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| | us-east-1d | subnet-4a721265 (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| | us-east-1e | subnet-e10770de (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |
| | us-east-1f | subnet-7aee1d75 (default) | Automatic | sg-1f1f336b - default sg-26dfc76e - Server |

Optional settings

Tags

Name: MyFirstEFS

Windows taskbar: Type here to search, 12:49, 08-06-2018

Optional settings

Tags

 Name: MyFirstEFS

Performance mode

General Purpose (default)

Encrypted

No

[Cancel](#)

[Previous](#)

[Create File System](#)

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Click on Create File System

Step 5: Finally creating FS

The screenshot shows the AWS Management Console interface for the Elastic File System (EFS) service. The browser tabs at the top include 'Inbox - nekkanti', 'EC2 Management', 'Elastic File System', 'IAM Management', and 'EC2 Management'. The address bar shows the URL: <https://console.aws.amazon.com/efs/home?region=us-east-1#/filesystems/fs-1b63f653>. The console header shows the AWS logo, 'Services', 'Resource Groups', and user information 'sahityan' in 'N. Virginia' with a 'Support' link.

On the left sidebar, 'File systems' is selected, with 'File syncs' as a sub-option. The main content area is titled 'File systems' and features a green success message box:

✓ **Success!**

You have created a file system. You can mount your file system from an EC2 instance with an NFSv4.1 client installed. You can also mount your file system from an on-premises server over an AWS Direct Connect connection. Click [here](#) for EC2 mount instructions, and [here](#) for on-premises mount instructions.

Below the message, there is a 'Create file system' button and an 'Actions' dropdown menu. A table lists the created file system:

| | Name | File system ID | Metered size | Number of mount targets | Creation date |
|-----|------------|----------------|--------------|-------------------------|----------------------|
| ● ▼ | MyFirstEFS | fs-1b63f653 | 6.0 KiB | 6 | 2018-06-08T07:23:10Z |

Below the table, there are two sections: 'Other details' and 'Tags'. The 'Other details' section shows:

- Owner ID: 084484736668
- Life cycle state: Available
- Performance mode: General Purpose
- Encrypted: No

The 'Tags' section shows a single tag: 'Name: MyFirstEFS'. A 'Manage tags' link is also present.

The Windows taskbar at the bottom shows the search bar, task view button, and several application icons including Edge, File Explorer, Mail, Chrome, WhatsApp, and others. The system clock shows 'ENG INTL 12:53 08-06-2018'.

DNS name fs-1b63f653.efs.us-east-1.amazonaws.com ?

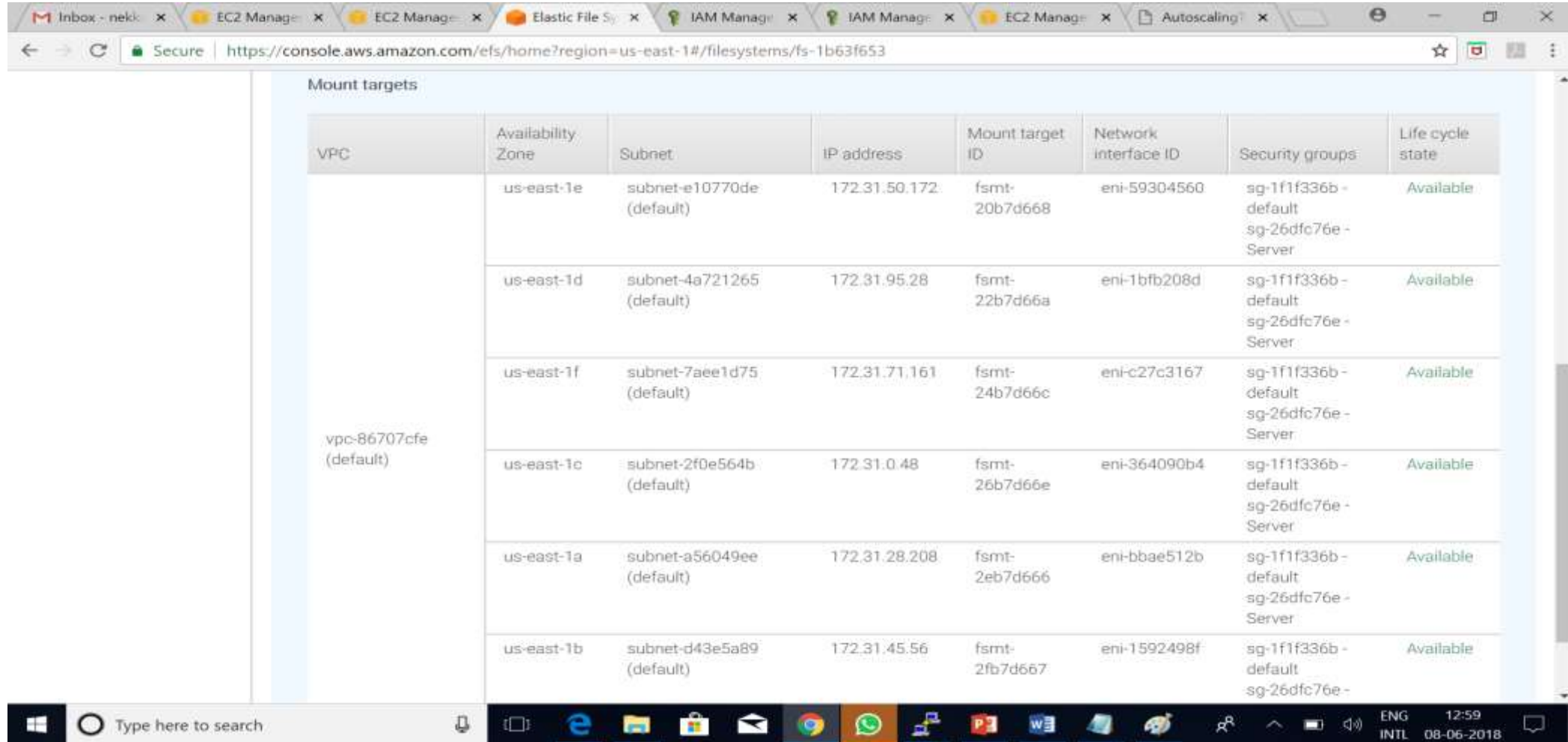
[Amazon EC2 mount instructions](#)

[AWS Direct Connect mount instructions](#)

Mount targets

| VPC | Availability Zone | Subnet | IP address | Mount target ID | Network interface ID | Security groups | Life cycle state |
|------------------------|-------------------|---------------------------|---------------|-----------------|----------------------|-----------------|------------------|
| vpc-86707cfe (default) | us-east-1e | subnet-e10770de (default) | 172.31.50.172 | fsmt-20b7d668 | eni-59304560 | | Creating |
| | us-east-1d | subnet-4a721265 (default) | 172.31.95.28 | fsmt-22b7d66a | eni-1bfb208d | | Creating |
| | us-east-1f | subnet-7aee1d75 (default) | 172.31.71.161 | fsmt-24b7d66c | eni-c27c3167 | | Creating |
| | us-east-1c | subnet-2f0e564b (default) | 172.31.0.48 | fsmt-26b7d66e | eni-364090b4 | | Creating |
| | us-east-1a | subnet-a56049ee (default) | 172.31.28.208 | fsmt-2eb7d666 | eni-bbae512b | | Creating |
| | us-east-1b | subnet-d43e5a89 (default) | 172.31.45.56 | fsmt-2fb7d667 | eni-1592498f | | Creating |

Step 6: Wait until Life cycle state changed to available



The screenshot displays the AWS Management Console interface for an Elastic File System (EFS). The browser's address bar shows the URL: <https://console.aws.amazon.com/efs/home?region=us-east-1#/filesystems/fs-1b63f653>. The page title is "Mount targets".

| VPC | Availability Zone | Subnet | IP address | Mount target ID | Network interface ID | Security groups | Life cycle state |
|------------------------|-------------------|---------------------------|---------------|-----------------|----------------------|---|------------------|
| vpc-86707cfe (default) | us-east-1e | subnet-e10770de (default) | 172.31.50.172 | fsmt-20b7d668 | eni-59304560 | sg-1f1f336b - default sg-26dfc76e - Server | Available |
| | us-east-1d | subnet-4a721265 (default) | 172.31.95.28 | fsmt-22b7d66a | eni-1bfb208d | sg-1f1f336b - default sg-26dfc76e - Server | Available |
| | us-east-1f | subnet-7aee1d75 (default) | 172.31.71.161 | fsmt-24b7d66c | eni-c27c3167 | sg-1f1f336b - default sg-26dfc76e - Server | Available |
| | us-east-1c | subnet-2f0e564b (default) | 172.31.0.48 | fsmt-26b7d66e | eni-364090b4 | sg-1f1f336b - default sg-26dfc76e - Server | Available |
| | us-east-1a | subnet-a56049ee (default) | 172.31.28.208 | fsmt-2eb7d666 | eni-bbae512b | sg-1f1f336b - default sg-26dfc76e - Server | Available |
| | us-east-1b | subnet-d43e5a89 (default) | 172.31.45.56 | fsmt-2fb7d667 | eni-1592498f | sg-1f1f336b - default sg-26dfc76e - | Available |

The Windows taskbar at the bottom shows the search bar with the text "Type here to search" and the system clock indicating the time is 12:59 on 08-06-2018.