


Module-10: FSx Assignment - 1

You have been asked to:


1. Create an FSx file system for a windows file server
 - a) Make sure you have AWS Managed Active Directory with a valid domain name
 - b) Connect it to your Windows EC2 server
2. Create an FSx file system for Lustre and attach it to an Amazon Linux 2 instance

Step 1: Choose an Amazon Machine Image (AMI)

[Cancel and Exit](#)



Windows

Microsoft Windows 2019 Datacenter edition, Microsoft SQL Server 2019 Standard. [English]
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes


Windows

Microsoft Windows Server 2019 with SQL Server 2019 Enterprise - ami-000e910ac186d1086
Microsoft Windows 2019 Datacenter edition, Microsoft SQL Server 2019 Enterprise. [English]
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select


Windows

Microsoft Windows Server 2022 Base - ami-00cefd54ba36dfd42
Microsoft Windows 2022 Datacenter edition. [English]
Free tier eligible
Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

Select

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance families Current generation [Show/Hide Columns](#)

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes

Step 5: Add Tags

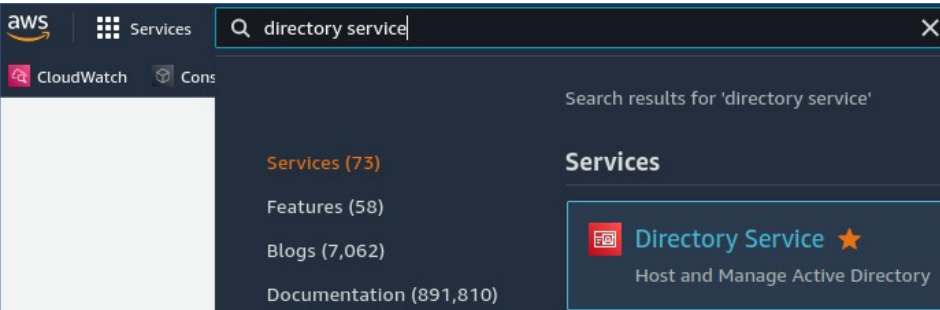
A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.

A copy of a tag can be applied to volumes, instances or both.

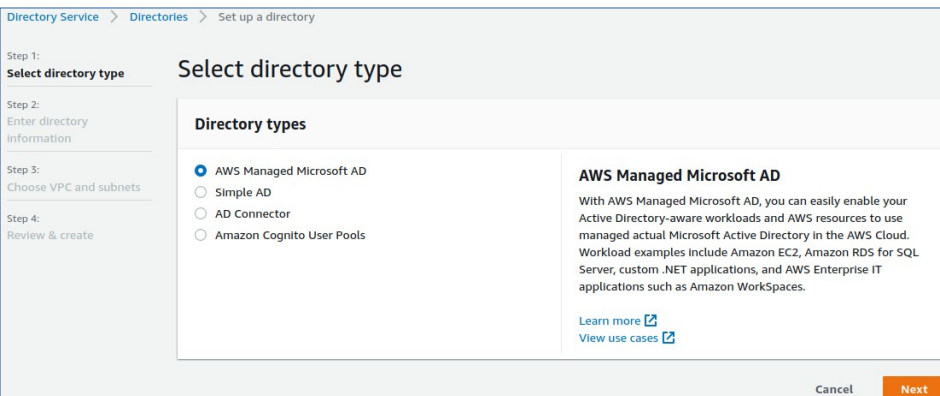
Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key	Value	Instances	Volumes	Network Interfaces	
Name	module_10_assignment_1_ec2_windows	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="X"/>
CreatedBy	Hariharan Narayanan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="X"/>

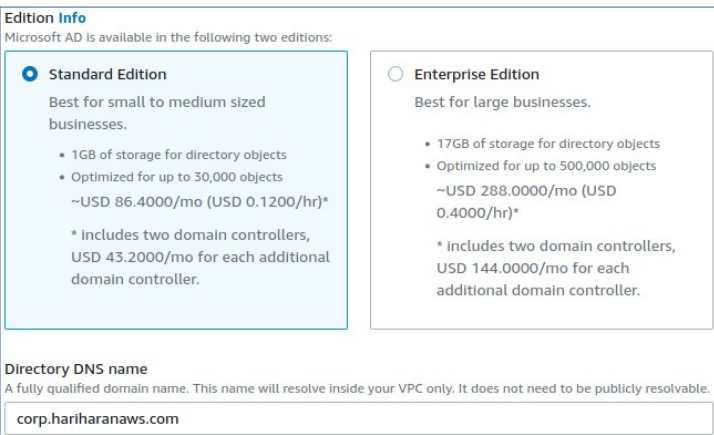
1. Create a Windows EC2 instance



2. Open Directory service



3. Select AWS Managed Microsoft AD



4. Select Standard edition

5. Provide a DNS name to the AD

Admin password

The password for the default administrative user named Admin.

.....

Passwords must be between 8 and 64 characters, not contain the categories: lowercase, uppercase, numeric, and special characters.

Confirm Password

.....

This password must match the Admin password above.

6. Provide password to the AD

Directory Service > Directories > Set up a directory

Step 1:
Select directory type

Step 2:
Enter directory
information

Step 3:
Choose VPC and subnets

Step 4:
Review & create

Choose VPC and subnets

Networking

The VPC that contains your directory. If you do not have a VPC with at least two subnets, you must create one.

VPC Info

vpc-0bb2355d0d49f42d0 (172.31.0.0/16)



[Create new VPC](#)

Subnets Info

No preference



No preference



[Create new subnet](#)

Initial AD site name for this directory [Info](#)

Default-First-Site-Name

Cancel

7. Provide the VPC (I provided the default VPC).
Save settings, review and create the AD.

**Did you know?**

You can deploy an AWS Managed Microsoft AD (Enterprise Edition) directory across AWS Regions. Once configured, AWS automatically replicates your directory data in multiple Regions so everything stays in sync. [Learn more](#)

**Directories (1)** [Info](#)

Actions ▾

[Set up directory](#)

Find by directory ID or name

< 1 >

Directory ID ▾	Directory name ▾	Type ▾	Size ▾	Multi-Region ▾	Status ▾	Launch date ▾
d-90675cb8ff	corp.hariharanaws.com	Microsoft AD	Standard	Not applicable	Active	Jan 30, 2022

8. Verify that AD is created properly and becomes "Active".



Services

fsx



CloudWatch



Cons

Search results for 'fsx'

Services (2)

Features (2)

Blogs (205)

Documentation (37,201)

Services**FSx** ★

Fully managed third-party file systems optimized for a variety of workloads

9. Open Fsx console.

Amazon FSx **File systems**

Volumes

Backups

▼ ONTAP

Storage virtual machines

▼ OpenZFS

Snapshots

▼ Windows File Server

▼ Lustre

Data repository tasks

FSx > File systems

**Did you know?**

With Amazon FSx for Windows File Server, you can reduce storage costs by 50-60% using Data Deduplication. [Learn how to easily enable this capability and others.](#)

File systems (0)

Attach

Actions

Filter file systems

File system name ▾	File system ID ▲	File system type ▾	Status ▾	Deployment type ▾	Storage type ▾	Storage capacity ▾	Throughput cap
Empty file systems You don't have any file systems.							
Create file system							

10. Create new file system

 Amazon FSx for Windows File Server



Amazon FSx
for Windows File Server

11. Select Windows File server

Create file system

File system details

File system name - optional [Info](#)

module_10_assignment_1_fsx_windows_fs

Maximum of 256 Unicode letters, whitespace, and numbers, plus + - = . _ : /

Deployment type [Info](#)

☒ Multi-AZ

☐ Single-AZ

Storage type [Info](#)

☒ SSD

☐ HDD

Storage capacity [Info](#)

32 GIB

Minimum 32 GiB; Maximum 65536 GiB

Throughput capacity [Info](#)

The sustained speed at which the file server hosting your file system can serve data. The file server can also burst to higher speeds for periods of time.

☒ Recommended throughput capacity

32 MB/s

☐ Specify throughput capacity

12. Provide FS name

13. Choose 32GiB as capacity

Network & security

Virtual Private Cloud (VPC) [Info](#)

Specify the VPC from which your file system is accessible.

Default VPC | vpc-0bb2355d0d49f42d0

14. Choose default VPC

VPC Security Groups [Info](#)

Specify VPC Security Groups to associate with your file system's network interfaces.

Choose VPC security group(s)

sg-0124c6b876719836e (default) X

15. Choose default SG

Preferred subnet [Info](#)

Specify the preferred subnet for your file system.

subnet-03bc8bc7122bf48a0 (us-east-1f)

Standby subnet

subnet-030af8e7ced9531f0 (us-east-1b)

16. Leave the subnets as chosen

Windows authentication

Choose an Active Directory to provide user authentication and access control for your file system [Info](#)

☒ AWS Managed Microsoft Active Directory

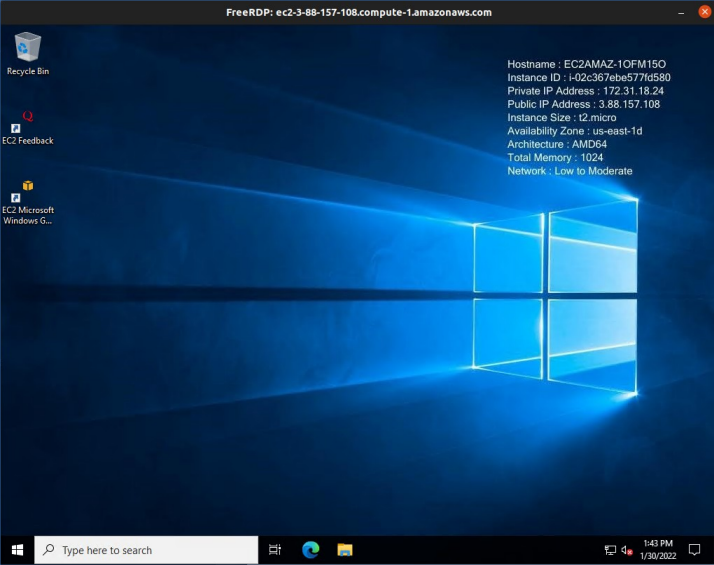
☐ Self-managed Microsoft Active Directory

Choose an AWS Managed Microsoft AD directory to use. [Info](#)

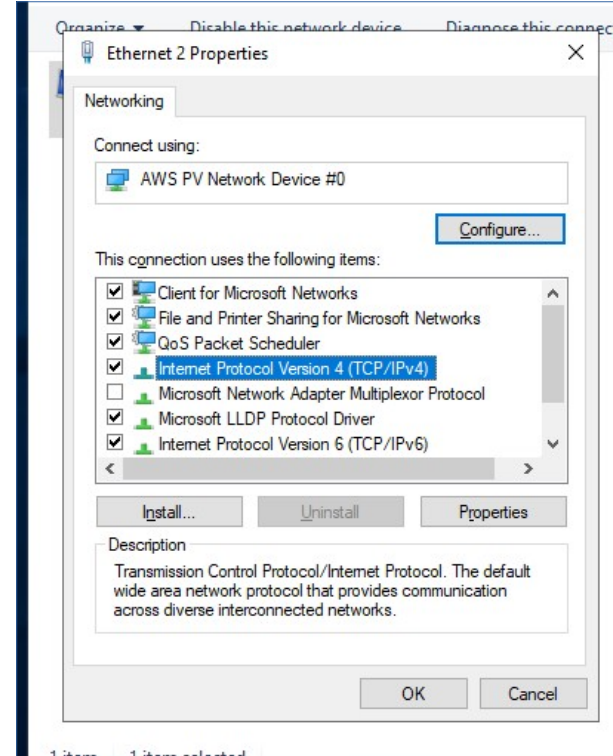
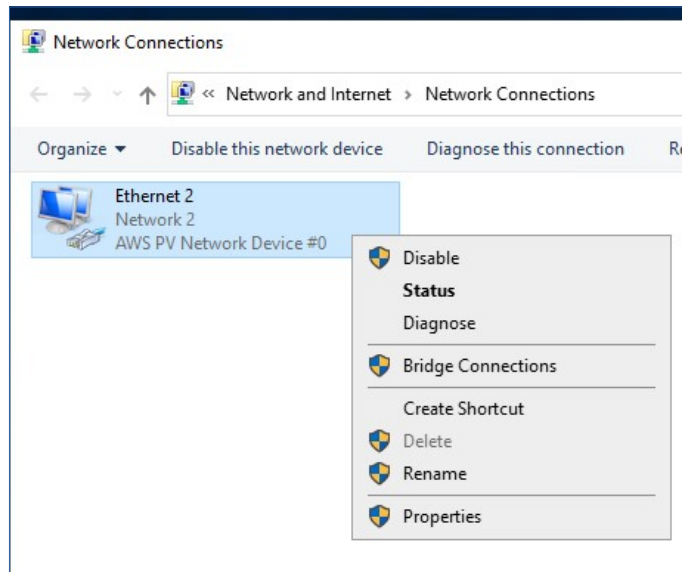
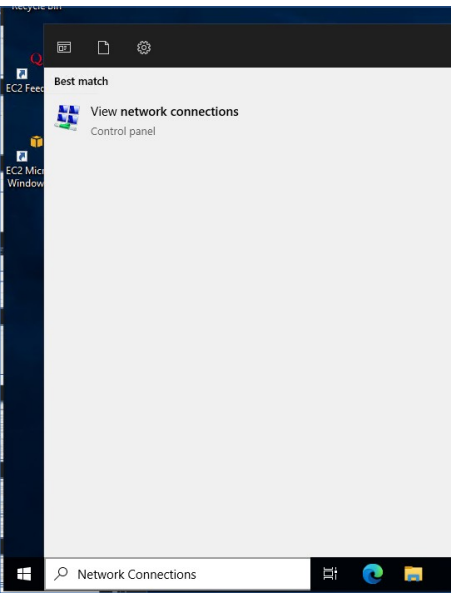
corp.hariharanaws.com | d-90675cb8ff (vpc-0bb2355d...

17. Select to attach AWS managed MSFT AD

18. Select the AD we created in (8).
Leave other settings as-is and create FS



19. Connect to the Windows EC2 instance created in (1), using any RDP client



20. Open Network Connections and Ipv4 Properties

Directory Service > Directories > d-90675cb8ff

d-90675cb8ff

Directory details

Directory type Microsoft AD	Directory DNS name corp.hariharanaws.com
Edition Standard	Directory NetBIOS name corp

Networking & security | Scale & share | Application management | Maintenance

Networking details

VPC vpc-0bb2355d0d49f42d0	Subnets subnet-04cbcff919e7fa62e subnet-0598c984411afe996
Availability zones us-east-1d us-east-1e	DNS address 172.31.25.69 172.31.51.6

21. Note the DNS addresses of the Windows AD we created

Internet Protocol Version 4 (TCP/IPv4) Properties

General | **Alternate Configuration**

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☒ Obtain an IP address automatically

☐ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server:

Alternate DNS server:

☐ Validate settings upon exit

Advanced...

OK Cancel

22. Provide the same in the Ipv4 properties DNS server addresses

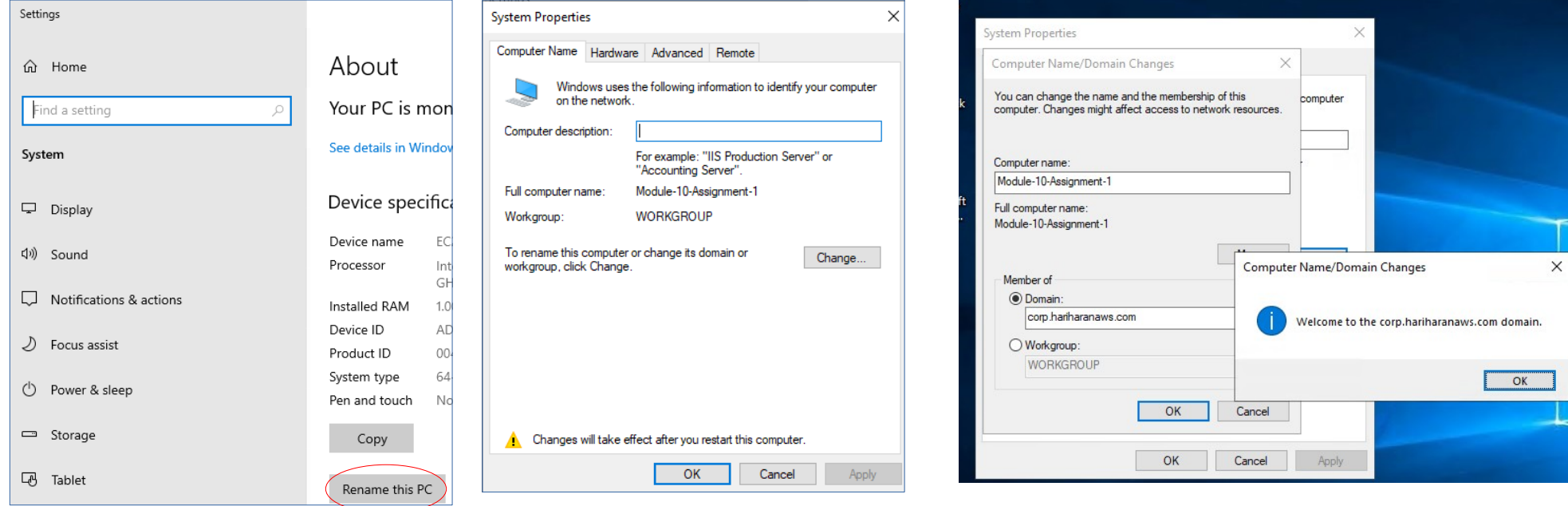
About your PC

System settings
Related: "system properties"

EC2 Micro Instance Windows

system properties

23. Open PC properties dialog to rename PC



24. Select to rename the PC. After rename, restart the EC2 instance and reconnect using RDP client

25. After restart, open System Properties and "Change" to change domain of this instance

26. In "Domain", provide the value of "Directory name" of the Windows AD we created in (8). Provide username and password of the Admin user we provided in (8)

This finishes parts (1.a) and (1.b) asked in the question

**Did you know?**

With Amazon FSx for Windows File Server, you can reduce storage costs by 50-60% using Data Deduplication.

[Learn how to easily enable this capability and others.](#)

**File systems (1)**

Attach

Actions ▾

Create file system

 Filter file systems

< 1 >



	File system name ▾	File system ID ▲	File system type ▾	Status ▾	Deployment type ▾	Storage type ▾	Storage capacity ▾	Throughput capacity ▾	Creation time ▾
<input type="radio"/>	module_10_assignment_1_fsx_windows_fs	fs-0fd7584764f2bce49 	Windows	✓ Available	Multi-AZ	SSD	32 GiB	32 MB/s	2022-01-30T16:55:12+05:30

Amazon FSx for Lustre

FSx
Amazon FSx
for Lustre

27. Repeat steps (9) and (10) to create another Fsx File System. Choose “Amazon Fsx for Lustre” this time.

Instances (1/2) Info

Connect

Instance state ▾

Actions ▾

Launch instance

 Search

	Name ▾	Instance ID	Instance state ▾	Instance type ▾	Status check	Alarm status	Availability Zone ▾	Public IPv4 DNS
<input type="checkbox"/>	module_10_assignment_1_ec2_windows	i-02c367ebe577fd580	✓ Running	t2.micro	✓ 2/2 checks passed	No alarms +	us-east-1d	ec2-3-88-157-108.com...
<input checked="" type="checkbox"/>	module_10_assignment_1_ec2_amazon_linux	i-0408d3928c07d99fa	✓ Running	t2.micro	✓ 2/2 checks passed	No alarms +	us-east-1d	ec2-52-90-159-242.co...

28. Create an EC2 instance of Amazon Linux

Create file system

File system details

File system name - optional [Info](#)

module_10_assignment_1_lustre_fs

29. Provide a name

Maximum of 256 Unicode letters, whitespace, and numbers, plus + - = . _ : /

Deployment and storage type [Info](#)

Select a deployment type and storage type to fit your workload requirements

- ☒ Persistent, SSD
- ☐ Persistent, HDD
- ☒ with SSD cache
- ☐ Scratch, SSD

Throughput per unit of storage [Info](#)

Throughput (MB/s) per unit of storage (TiB)

- ☒ 125 MB/s/TiB
- ☐ 250 MB/s/TiB
- ☐ 500 MB/s/TiB
- ☐ 1000 MB/s/TiB

Storage capacity [Info](#)

1.2 TiB

30. Provide 1.2 TiB as default storage capacity

Supported sizes: 1.2 TiB or increments of 0.5 TiB

Throughput capacity [Info](#)

Throughput capacity = Storage capacity * Throughput per unit of storage

0 MB/s

Network & security

Virtual Private Cloud (VPC) [Info](#)

Specify the VPC from which your file system is accessible.

Default VPC | vpc-0bb2355d0d49f42d0

31. Provide default VPC

VPC Security Groups [Info](#)

Specify VPC Security Groups to associate with your file system

Choose VPC security group(s)

sg-0124c6b876719836e (default) X

32. Provide default SG

The VPC Security Groups associated with your file system's network interface (e.g., eni-1021-1023).

Subnet [Info](#)

Specify the subnet in which your file system's network interface is created

subnet-06ff45607e4f38776 (us-east-1a)

33. Leave subnet as-is

📘 You can now check network connectivity with Reachability Analyzer

[Run Reachability Analyzer](#)**Inbound rules (5)**[Manage tags](#)[Edit inbound rules](#)

< 1 >

<input type="checkbox"/>	Name ▾	Security group rule... ▾	IP version ▾	Type ▾	Protocol ▾	Port range ▾	Source ▾	Description
<input type="checkbox"/>	-	sgr-0bbfa0efba7e76003	-	Custom TCP	TCP	988	sg-0a9906ec8394efed...	Allows Lustre traffic be
<input type="checkbox"/>	-	sgr-0d56e670296d77...	-	Custom TCP	TCP	1021 - 1023	sg-0124c6b87671983...	Allows Lustre traffic be
<input type="checkbox"/>	-	sgr-0450934b784446...	-	Custom TCP	TCP	988	sg-0124c6b87671983...	Allow Lustre traffic be
<input type="checkbox"/>	-	sgr-0f7d574ebfc79fa5e	-	Custom TCP	TCP	1021 - 1023	sg-0a9906ec8394efed...	Allows Lustre traffic be
<input type="checkbox"/>	-	sgr-080da9c686f5ff308	-	All traffic	All	All	sg-0124c6b87671983...	-

sg-0124c6b876719836e - default

📘 You can now check network connectivity with Reachability Analyzer

[Run Reachability Analyzer](#)**Outbound rules (5)**[Manage tags](#)[Edit outbound rules](#)

< 1 >

<input type="checkbox"/>	Name ▾	Security group rule... ▾	IP version ▾	Type ▾	Protocol ▾	Port range ▾	Destination ▾	Description
<input type="checkbox"/>	-	sgr-0548fdc148c61df31	-	Custom TCP	TCP	988	sg-0a9906ec8394efed...	Allow Lustre traffic be
<input type="checkbox"/>	-	sgr-0e0240aee46ea9d93	-	Custom TCP	TCP	1021 - 1023	sg-0a9906ec8394efed...	Allow Lustre traffic be
<input type="checkbox"/>	-	sgr-0aae82309aa1ce865	IPv4	All traffic	All	All	0.0.0.0/0	-
<input type="checkbox"/>	-	sgr-0db64dda2dfaab7e1	-	Custom TCP	TCP	1021 - 1023	sg-0124c6b87671983...	Allow Lustre traffic be
<input type="checkbox"/>	-	sgr-016b0f53261c54fd8	-	Custom TCP	TCP	988	sg-0124c6b87671983...	Allow Lustre traffic be

34. Modify inbound rules for default SG to add rules to allow traffic to between Lustre servers and clients.

35. Modify outbound rules for default SG to add rules to allow traffic to between Lustre servers and clients.

Details **Inbound rules** Outbound rules Tags

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Inbound rules (3)

Filter security group rules

< 1 > ⚙

<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
<input type="checkbox"/>	-	sgr-034fb6b9ba502ff34	-	Custom TCP	TCP	988	sg-0124c6b87671983...	Allows Lustre traffic be
<input type="checkbox"/>	-	sgr-0deb62811dd1c28...	IPv4	SSH	TCP	22	0.0.0.0/0	-
<input type="checkbox"/>	-	sgr-08fb138080e0c389e	-	Custom TCP	TCP	1021 - 1023	sg-0124c6b87671983...	Allows Lustre traffic be

36. Modify inbound rules for SG of Amazon Linux instance created in (28) to add rules to allow traffic to between Lustre servers and clients.

Details Inbound rules **Outbound rules** Tags

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Outbound rules (3)

Filter security group rules

< 1 > ⚙

<input type="checkbox"/>	Name	Security group rule...	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sgr-029918b678c6d1...	-	Custom TCP	TCP	988	sg-0124c6b87671983...	Allow Lustre traffic be
<input type="checkbox"/>	-	sgr-0bfd1535b310cfb57	IPv4	All traffic	All	All	0.0.0.0/0	-
<input type="checkbox"/>	-	sgr-0871b811be807c0...	-	Custom TCP	TCP	1021 - 1023	sg-0124c6b87671983...	Allow Lustre traffic be

37. Modify outbound rules for SG of Amazon Linux instance created in (28) to add rules to allow traffic to between Lustre servers and clients.

38. Open a SSH session into the Amazon Linux instance created in (28)

```

  _|  _|_ )
  _|  ( _|_ /
  _|\_||_|

Amazon Linux 2 AMI

https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-16-137 ~]$ uname -r
5.10.93-87.444.amzn2.x86_64

```

```

[ec2-user@ip-172-31-16-137 ~]$ sudo amazon-linux-extras install -y lustre2.10
Installing lustre-client

```

39. Install the Lustre file-system client

```

Installed:
lustre-client.x86_64 0:2.10.8-5.amzn2

```

```

[ec2-user@ip-172-31-16-137 ~]$ sudo mount -t lustre -o noatime,flock fs-09d9355b7dad6bb3e.fsx.us-east-1.amazonaws.com@tcp:/wcynjbmv /fsx
[ec2-user@ip-172-31-16-137 ~]$ ls
[ec2-user@ip-172-31-16-137 ~]$ df
Filesystem                1K-blocks    Used   Available Use% Mounted on
devtmpfs                  485568      0    485568      0% /dev
tmpfs                     494344      0    494344      0% /dev/shm
tmpfs                     494344    488    493856      1% /run
tmpfs                     494344      0    494344      0% /sys/fs/cgroup
/dev/xvda1                8376300 1585868   6790432    19% /
tmpfs                     98872      0     98872      0% /run/user/1000
172.31.44.68@tcp:/wcynjbmv 1201383168 7936 1201373184      1% /fsx
tmpfs                     98872      0     98872      0% /run/user/0

```

40. Finally, create a directory called ~/fsx and mount the Lustre filesystem with this directory as the a mount directory. Verify that the file system was mounted correctly.

This finishes part (2) asked in the question