

# Proof-of-Concept Report

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## Abstract

In this report, I will discuss the future IT migration for Don & Associates. This is to ensure efficiency and maintainability for all customers, staff, and executives. The migration to the cloud would provide significant improvements within the company. One of these improvements would be guaranteed sustainability. With the help of third-party cloud vendors, Don & Associates will thrive and meet the companies' future goals, and even exceed them.

## Introduction

The goal of this project is to expand Don & Associates to other regions within the U.S.A and possibly Canada. Don & Associates is a financial consulting company looking to expand into different regions. Since the company operates within the northeast of the United States, it is hard to branch out to different regions. Especially, finding clients in these areas that will take an interest in Don & Associates and their services.

## Statement of Need

Many companies like Don & Associates struggle with the cost of a sophisticated network. By migrating the network to the cloud, Don & Associates would save a lot of money on IT, maintenance, physical space, storage, and many more features that the cloud offers. Cloud providers create features for all types of industries and can be considered more secure than current IT infrastructures.

Especially in today's economic climate, it is increasingly harder to obtain physical IT infrastructure, this includes hubs, switches, workstations, servers, routers and more. With the use of the cloud, the need for physical equipment and space is very minimal. Cloud providers will provide your resources over the internet at high speeds, at a small cost, across different regions of your choosing.

## Assumptions

State any assumptions you made as part of the process.

Moving Don & Associates' current IT infrastructure into the cloud would be the best option for the company, for whenever the company plans to expand its customer base. My recommendation would be to choose Amazon Web Services (AWS) as our cloud vendor. AWS

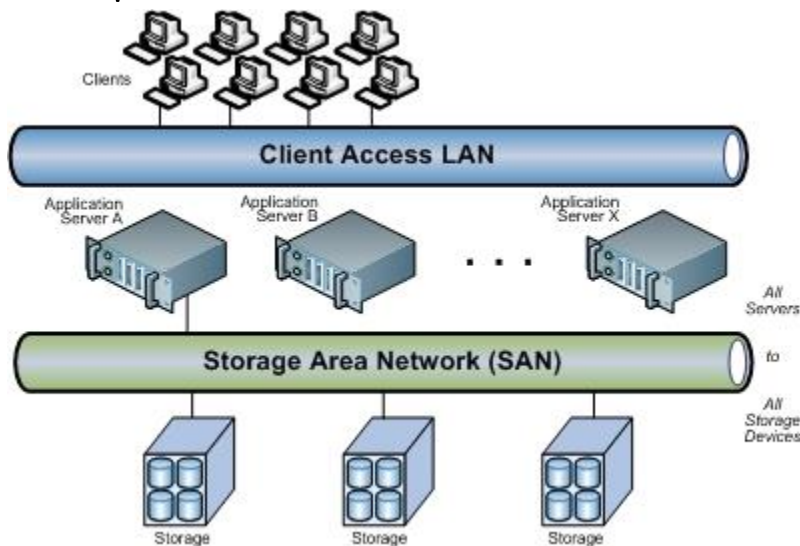


provides and caters to companies' specific needs and demands at a low cost. Unlike other cloud vendors, AWS has upfront and fair pricing. Whenever you decide to add a specific feature, it will tell you its monthly and annual pricing before purchasing. Other cloud vendors such as Google and Microsoft indicate on their pages 'Please contact a sales representative' for many basic features that should not have any hidden cost. Furthermore, AWS has many features available for financial consulting companies. There are over 300 AWS case studies from financial companies and organizations, citing how AWS has helped their business grow with its vast number of features. Some of these features include EC2, S3, RDS, SQS, Connect, Polly, Contact Lens and many more features provided by AWS.

With the help of AWS, Don & Associates would be able to expand into further regions in the northeast, and other parts of the United States. This is because of its 4 dedicated regions, with a significant number of availability zones. Through these methods, virtualization (virtual computers) can be deployed in other regions to expand and gain a customer base, customer support can be streamlined and heavily automated, saving time and money on human resources.

Although migration to Amazon Web Services may seem large and unnecessary to some in the company, it is quite simple. Don & Associates will keep their current IT infrastructure, while AWS will provide virtual computing features that will facilitate key components in the company that can now be streamlined. Additionally, AWS is a user-friendly user interface. It is easy to navigate, search, and edit in a matter of seconds. Instead of staff seeing AWS as a disadvantage, they might see it as a significant advantage because of the simplistic user interface that Amazon provides.

## Description of Current Infrastructure



The company currently uses a Storage Area Network also known as SAN.

It is comprised with large storage devices, servers, switches, hubs, routers, and end machines (Staff computers)

In this case, all of Don & Associates IT infrastructure will still be used with the addition of AWS. This solution is typically called a hybrid-cloud network. With AWS as our cloud provider, the company would be able to reach its goals by scaling, expanding storage, expanding end devices and servers through different regions and availability zones. This would be the best solution for the company's planned expansion.

## Cloud Service Providers

The top three cloud service providers are Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP).

**Amazon Web Services (AWS):** AWS is the most popular cloud service provider, offering a wide range of services such as computing, storage, databases, analytics, machine learning, security, and more. AWS also provides services like Amazon S3 (Simple Storage Service), Amazon EC2 (Elastic Compute Cloud), Amazon RDS (Relational Database Service), Amazon Lambda, and Amazon SQS (Simple Queue Service).

Advantages of AWS:

Offers a vast range of services.

Highly secure and reliable

Easy to use and integrate with other services.

Offers a wide range of pricing options.

Better customer support than the 2 other major cloud vendors

Disadvantages of AWS:

May be complex for beginners.

Pricing can be confusing at times.

Support can be slow (not often)

**Microsoft Azure:** Microsoft Azure is another popular cloud service provider, providing a range of services including computing, storage, databases, networking, machine learning, analytics, and more. Azure also offers services like Azure Virtual Machines, Azure SQL Database, Azure Cosmos DB, and Azure Functions.

Advantages of Azure:

Offers a wide range of services.

Easy to use and integrate with other services.

Strong hybrid cloud capabilities

Offers a range of pricing options.

Disadvantages of Azure:

May be complex for beginners.

Some services may be expensive.

Support can be slow.

Google Cloud Platform (GCP): GCP offers a range of services, including computing, storage, databases, networking, machine learning, security, and more. GCP also provides services like Google Compute Engine, Google Cloud Storage, Google Cloud SQL, and Google Cloud Functions.

Advantages of GCP:

Offers a wide range of services.

Offers advanced machine learning and analytics capabilities.

Easy to use and integrate with other services.

Disadvantages of GCP:

May be complex for beginners.

Some services may be expensive.

Limited support compared to AWS and Azure

## Project Details

Building a VPC on AWS

. Step 1: Login to AWS UI. Click 'Features' and Click 'VPC'. Alternatively, you can search for VPC.

Step 2: Once you are redirected to the VPC page, you should see a option on the right of your screen called 'Create VPC', select this option.

Step 3: Configure your VPC, choose your IP CIDR block depending on the function of the IP address (10.0.0.0/16, 10.0.0.2/24, and more.)

Step 4: Make your VPC Name, Ex: Don&AssociatesVPC 1, then include a public subnet to the VPC. Choose an Availability zone, name your subnet that you just included in your VPC.

Step 5: Leave all other options the same and choose Create VPC. This process usually takes 2-10 minutes.

Step 6: To create an active VPC, you must have 2 subnets, so another one will be created.

Step 7: On the navigation pane (left side of your screen) select 'Subnets'

Step 8: Select the current subnet you just made, and choose 'Create Subnet.'

Step 9: Name your subnet Ex: Sub2, then select the VPC that was just created (Don&AssociatesVPC 1)

Step 10: Choose another availability zone other than your first subnet you created. And choose the appropriate IP CIDR block for the second subnet. Then, create your subnet, finally, you should have an active VPC.

### Launching a Web Server on AWS

Describe the steps used in launching a web server on an instance.

Step 1: In the AWS User Interface search for 'EC2' and select 'EC2'

Step 2: Select the yellow button 'Launch Instance' this will launch and create your EC2 instance.

Step 3: While the EC2 instance is launching, update your security groups, monitor your instance.

Step 4: When the EC2 instance has launched and is ready, copy the IPv4 address (ex:192.168.1.2) and paste the address in a separate internet browser.

Step 5: You will see that you have successfully created a web instance, if your browser indicates that the webpage is not safe, click 'advanced' and select 'visit the unsafe site.' From here you will see that you have just created a successful web page using EC2!

## Challenges Encountered

One challenge I came across when building a VPC was not configuring it correctly. When I launched the VPC, I had 2 subnets under 1 availability zone. Once I configured the second subnet to a different availability zone, the VPC was correctly configured. To avoid this in the future, make sure that when creating a VPC, 2 subnets must be in 2 different availability zones.

## Conclusion

By using AWS, Don & Associates can create a thriving work environment with new customers across different regions and areas in the United States. By expanding with AWS, not only is the company saving money, but also time and human resources. By incorporating AWS more of our employees can focus on innovation and creativity. Furthermore, if Don & Associates chooses to expand without AWS, or any cloud vendor, the pricing of this expansion would be a significant burden on the company. It would also affect the amount of work each staff member has to do. I believe that incorporating a cloud solution would be ultimately beneficial. It eliminates risk with its cost, user friendly capabilities, scalability, reliability and more.

## References

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## Appendix - Screenshots

### Start Lab

Include a screenshot of the following page to show the time you started the lab.

EN-US

### Start Lab

Region: us-east-1  
Lab ID: arn:aws:cloudformation:us-east-1:948492429944:stack/c13546a13331914030333t1w948492429944/49661b00-e92a-11ed-bffb-0ab9ea6915a5  
Creation Time: 2023-05-02T13:45:34-0700

Start session at: 2023-05-02T13:45:35-0700  
Remaining session time: 01:30:00 (90 minutes)

Lab status: ready

## Lab 2: Server

### Lab overview

In this lab, you will create the following components to build a server in a subnet in the us-east-1 region:

- Amazon Virtual Private Cloud (VPC)

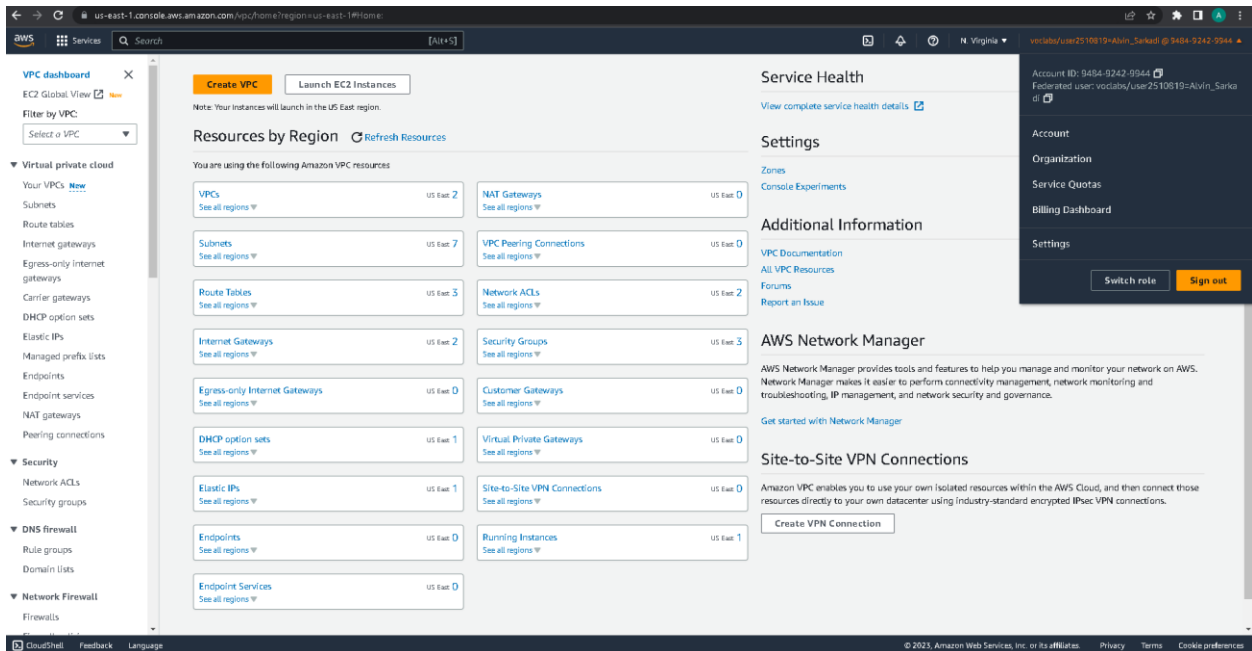
resources into a VPC, create a network that you can use to connect your infrastructure.

After completion of this lab, you will have:

- Create a VPC
- Create subnets
- Configure a route table
- Launch an EC2 instance

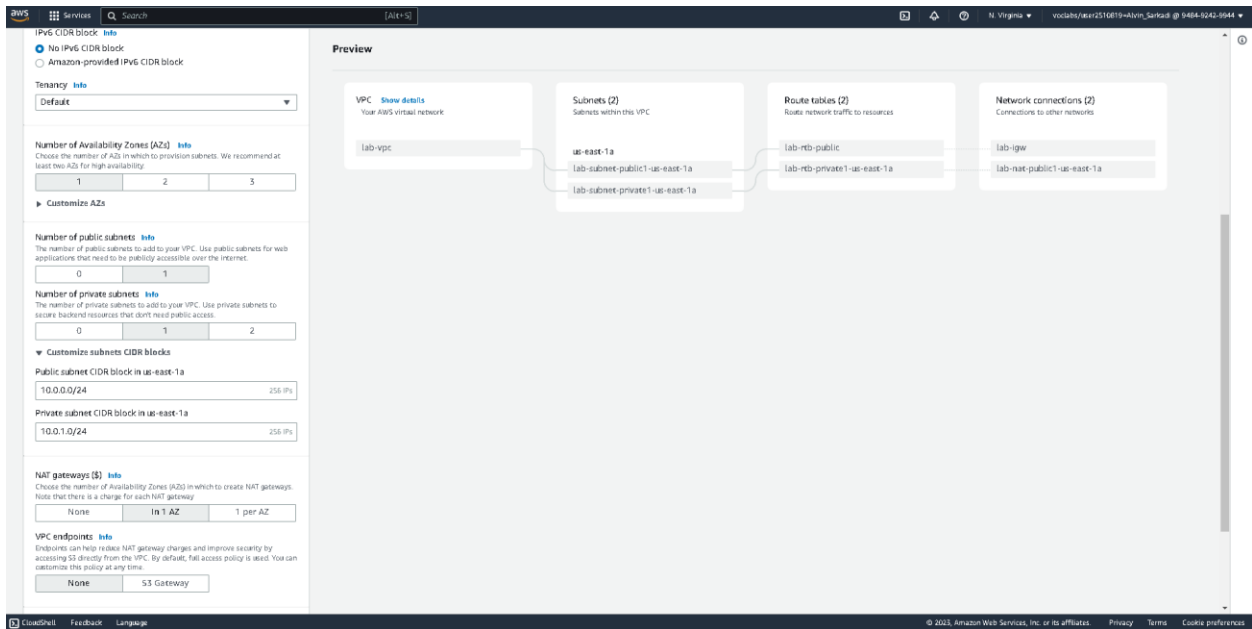
Source: AWS

### AWS Management Console Name



Source: AWS

## Task 1: Create Your VPC



## Task 2: Create Additional Subnets

**Subnets (1/5) Info**

Available IPv4 addresses: 250 | Available IPv4 addresses: 251 | Clear filters

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR	Available IPv4 addresses	Availability Zone	Avi
Work Public Subnet	subnet-0f160e644ac11b4a	Available	vpc-012de88beb83444ad   ...	10.0.0.0/24	-	250	us-east-1a	us-east-1a
lab-subnet-public2	subnet-0b1b7c935aad165b8	Available	vpc-055a303f0c6ed3ae1   la...	10.0.2.0/24	-	251	us-east-1b	us-east-1b
lab-subnet-public...	subnet-0c674a451b5558c83	Available	vpc-055a303f0c6ed3ae1   la...	10.0.0.0/24	-	250	us-east-1a	us-east-1a
lab-subnet-private2	subnet-065b158eEcc0d9d05	Available	vpc-055a303f0c6ed3ae1   la...	10.0.3.0/24	-	251	us-east-1b	us-east-1b
lab-subnet-private...	subnet-06aa3298d86118826	Available	vpc-055a303f0c6ed3ae1   la...	10.0.1.0/24	-	251	us-east-1a	us-east-1a

**subnet-065b158eEcc0d9d05 / lab-subnet-private2**

Details | Flow logs | Route table | Network ACL | CIDR reservations | Sharing | Tags

**Details**

Subnet ID	subnet-065b158eEcc0d9d05	Subnet ARN	arn:aws:ec2:us-east-1:948492429944:subnet/subnet-065b158eEcc0d9d05	State	Available	IPv4 CIDR	10.0.3.0/24
Available IPv4 addresses	251	Availability Zone	us-east-1b	Availability Zone ID	us-east-1b	Network ACL	acl-058c3ebd69e7e87fb
Network border group	us-east-1	Route table	rtb-0a6761e8e58b4bc11	Auto-assign IPv6 address	No	Auto-assign customer-owned IPv4 address	No
Default subnet	No	VPC	vpc-055a303f0c6ed3ae1   lab-vpc	Auto-assign public IPv4 address	No		

You have successfully updated subnet associations for rb-0514b01564f8c9e5 / lab-rb-public.

**Route tables (6) Info**

Filter route tables

Name	Route table ID	Explicit subnet associa...	Edge associations	Main	VPC	Owner ID
-	rtb-0a6761e8e58b4bc11	-	-	Yes	vpc-055a303f0c6ed3ae1   la...	948492429944
Work Public Route ...	rtb-01b2c445ea4f77037	subnet-0f160e644ac11b4a...	-	No	vpc-012de88beb83444ad   ...	948492429944
lab-rb-public	rtb-0514b01564f8c9e5	2 subnets	-	No	vpc-055a303f0c6ed3ae1   la...	948492429944
lab-rb-private1 (a...	rtb-027f07f88be9c4998	2 subnets	-	No	vpc-055a303f0c6ed3ae1   la...	948492429944
-	rtb-03d0d85cbe067530	-	-	Yes	vpc-012de88beb83444ad   ...	948492429944
-	rtb-0a564983a0d6e3142	-	-	Yes	vpc-07b39962d47c3b8a	948492429944

Select a route table

### Task 3: Create a VPC Security Group

Security group (sg-010292130e99d7115 | Web Security Group) was created successfully

Details

VPC > Security Groups > sg-010292130e99d7115 - Web Security Group

**sg-010292130e99d7115 - Web Security Group** Actions

**Details**

Security group name Web Security Group	Security group ID sg-010292130e99d7115	Description Enable HTTP access	VPC ID vpc-055a303f0c6ed3ae1
Owner 948492429944	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry	

**Inbound rules** | Outbound rules | Tags

You can now check network connectivity with Reachability Analyzer Run Reachability Analyzer

**Inbound rules (1/1)** Filter security group rules Manage tags Edit inbound rules

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sg-052e57a7c867e...	IPv4	HTTP	TCP	80	0.0.0.0/0	Permit web requests

## Task 4: Launch a Web Server Instance

aws Load Test RDS

Meta-Data	Value
Instanceid	i-01c40738a67c2c796
Availability Zone	us-east-1b

Current CPU Load: 0%

Instances | EC2 Management Console

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#instances

Instances (1/2) Connect Instance state Actions Launch instances

check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
check passe	No alarms	us-east-1a	ec2-3-91-8-164.comp...	3.91.8.164	-
check passe	No alarms	us-east-1b	ec2-54-91-107-48.co...	54.91.107.48	-

**Instance: i-01c40738a67c2c796 (Web Server 1)**

Hostname type Private IP DNS name (IPv4 only)