

## Preview: ITEC5050 : Cloud Architecture and Distributed Systems

### Syllabus

#### Course Overview

In this course, you will extend your knowledge of enterprise networking by focusing on distributed systems, and the key characteristics and benefits of cloud computing, including reliability, scalability, and virtualization. You will examine core cloud technologies and challenges, along with various delivery models, including Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). Additionally, you will explore cloud architecture for platforms and cloud-based solutions and services, with associated cloud computing design patterns. You will gain hands-on experience in a cloud environment by building, configuring, and consuming cloud-based architectures to address the needs of an organization. This course provides a series of labs for building cloud computing services.

#### Technology Resources

Use of the following third-party resource is strongly recommended to support you in completing the course objectives. If you have access to other tools that you believe may still meet course requirements or if you have any difficulties accessing this resource or completing the related assignments, please contact your course faculty member to discuss potential alternatives.

- This course offers labs through Qwiklabs, an online learning environment that simulates a live, real-world, scenario-based use case. In a lab, you will have access to the actual environment you want to learn about, not a simulation or demo environment. You can access the lab environment from anywhere on the Internet using a standard browser. Most labs require credits to access, but there are a variety of free introductory labs available as well.
- Get started with [Qwiklabs help](#).

#### Course Competencies

(Read Only)

To successfully complete this course, you will be expected to:

- 1 Explain the design and features of cloud computing required to support a variety of distributed system needs.
- 2 Apply core cloud computing capabilities to develop a cloud infrastructure strategy to meet organizational needs.

- 3 Recommend an optimal cloud delivery model to address specific organizational needs.
- 4 Evaluate the potential benefits and business cost associated with cloud deployment options.
- 5 Deploy and implement a cloud computing design pattern to address defined organizational needs.
- 6 Communicate effectively to non-technical audiences.

### **Course Prerequisites**

Prerequisite(s): Completion of or concurrent registration in ISTM5110.

**Syllabus >> Course Materials**

**Required**

The materials listed below are required to complete the learning activities in this course.

## Library

The following required readings are provided in the Capella University Library or linked directly in this course. To find specific readings by journal or book title, use [Journal and Book Locator](#). Refer to the [Journal and Book Locator library guide](#) to learn how to use this tool.

- Baron, J., Baz, H., Bixler, T., Gaut, B., Kelly, K., Senior, S., & Stamper, J. (2017). [AWS certified solutions architect official study guide: Associate exam](#). Indianapolis, IN: Wiley.

## External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Amazon Web Services. (2010, Apr 7). [Introducing the Amazon Simple Notification Service \[Blog post\]](#). Retrieved from <https://aws.amazon.com/blogs/aws/introducing-the-amazon-simple-notification-service/>
- Amazon Web Services. (n.d.). [Amazon Machine Learning features](#). Retrieved from <https://aws.amazon.com/aml/features/>
- Amazon Web Services. (n.d.). [Amazon Route 53](#). Retrieved from <https://aws.amazon.com/route53/>
- Amazon Web Services. (n.d.). [Basic Amazon SQS architecture](#). Retrieved from <https://docs.aws.amazon.com/AWSSimpleQueueService/latest/SQSDeveloperGuide/sqs-basic-architecture.html>
- Amazon Web Services. (n.d.). [Databases on AWS](#). Retrieved from <https://aws.amazon.com/products/databases/>
- Amazon Web Services. (n.d.). [Introduction to Amazon S3](#). Retrieved from <https://docs.aws.amazon.com/AmazonS3/latest/dev/Introduction.html>
- Amazon Web Services. (n.d.). [Overview of Amazon Web Services: AWS whitepaper \[PDF\]](#). Retrieved from <https://d1.awsstatic.com/whitepapers/aws-overview.pdf>
- Amazon Web Services. (n.d.). [Types of cloud computing](#). Retrieved from <https://aws.amazon.com/types-of-cloud-computing>
- Amazon Web Services. (n.d.). [Understanding how IAM works](#). Retrieved from <https://docs.aws.amazon.com/IAM/latest/UserGuide/intro-structure.html>
- Amazon Web Services. (n.d.). [What is Amazon SE Glacier?](#) Retrieved from <https://docs.aws.amazon.com/amazonglacier/latest/dev/introduction.html>
- Amazon Web Services. (n.d.). [What is cloud computing? \[Video\]](#). | [Transcript](#) Retrieved from <https://aws.amazon.com/what-is-cloud-computing>
- Cardenas, S. (2017). [Building a modular and scalable virtual network architecture with Amazon VPC: Quick start reference deployment](#). Retrieved from <https://docs.aws.amazon.com/quickstart/latest/vpc/welcome.html>
- Ecourse Review. (2017). [Cloud computing services models - IaaS, PaaS, and SaaS explained \[Video\]](#). | [Transcript](#) Retrieved from <https://www.youtube.com/watch?v=36zducUX16w>
- Qwiklabs. (n.d.). [Introduction to Amazon EC2 Auto Scaling](#). Retrieved from [https://qwiklabs.com/catalog\\_lab/233](https://qwiklabs.com/catalog_lab/233)

- Qwiklabs. (n.d.). [Introduction to Amazon EC2](https://qwiklabs.com/catalog_lab/791). Retrieved from https://qwiklabs.com/catalog\_lab/791
- Qwiklabs. (n.d.). [Introduction to Amazon Elastic Block Store \(EBS\)](https://amazon.qwiklabs.com/catalog_lab/102). Retrieved from https://amazon.qwiklabs.com/catalog\_lab/102
- Qwiklabs. (n.d.). [Introduction to Amazon Machine Learning](https://amazon.qwiklabs.com/catalog_lab/252). Retrieved from https://amazon.qwiklabs.com/catalog\_lab/252
- Qwiklabs. (n.d.). [Introduction to Amazon Route 53](https://amazon.qwiklabs.com/catalog_lab/235). Retrieved from https://amazon.qwiklabs.com/catalog\_lab/235
- Qwiklabs. (n.d.). [Introduction to Amazon Simple Storage Service \(S3\)](https://qwiklabs.com/catalog_lab/177). Retrieved from https://qwiklabs.com/catalog\_lab/177
- Qwiklabs. (n.d.). [Introduction to Amazon Virtual Private Cloud \(VPC\)](https://amazon.qwiklabs.com/catalog_lab/200). Retrieved from https://amazon.qwiklabs.com/catalog\_lab/200
- Qwiklabs. (n.d.). [Working with elastic load balancing](https://amazon.qwiklabs.com/catalog_lab/155). Retrieved from https://amazon.qwiklabs.com/catalog\_lab/155

## Suggested

The following materials are recommended to provide you with a better understanding of the topics in this course. These materials are not required to complete the course, but they are aligned to course activities and assessments and are highly recommended for your use.

### External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Qwiklabs. (n.d.). [Sign in to Qwiklabs Support](https://qwiklab.zendesk.com). Retrieved from https://qwiklab.zendesk.com

## Optional

The following optional materials are offered to provide you with a better understanding of the topics in this course. These materials are not required to complete the course.

### External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Ecourse Review. (n.d.). [Cloud computing pros and cons for business and IT professionals](https://ecoursereview.com/cloud-computing-pros-and-cons-for-business-it/). Retrieved from <https://ecoursereview.com/cloud-computing-pros-and-cons-for-business-it/>

## Unit 1 >> What is Cloud Computing?

### Introduction

Welcome to the course! We will begin with an overview of cloud computing. In this unit, you will learn how Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) provide cloud computing services to clients. In addition, you will learn general cloud computing concepts and what cloud services are available.

The outcomes for this unit are as follows:

- Describe cloud computing.
- Define IaaS, PaaS, and SaaS.
- Explain cloud computing concepts, i.e., EC2 Instance, Elastic Beanstalk.
- Create a Qwiklabs account that you will use to access the Amazon Web Services (AWS) labs for this course.

### Learning Activities

#### u01s1 - What Is Cloud Computing?

### Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 1, "Introduction to AWS."

Use the Internet to read:

- Amazon Web Services. (n.d.). [Overview of Amazon Web Services: AWS whitepaper \[PDF\]](https://d1.awsstatic.com/whitepapers/aws-overview.pdf). Retrieved from <https://d1.awsstatic.com/whitepapers/aws-overview.pdf>
  - Use this whitepaper overview as a handy reference throughout the duration of the course.
- Amazon Web Services. (n.d.). [Types of cloud computing](https://aws.amazon.com/types-of-cloud-computing). Retrieved from <https://aws.amazon.com/types-of-cloud-computing>

### Videos

Use the Internet to complete the following:

- Amazon Web Services. (n.d.). [What is cloud computing?](https://aws.amazon.com/what-is-cloud-computing) [Video] | [Transcript](#). Retrieved from <https://aws.amazon.com/what-is-cloud-computing>
- Ecourse Review. (2017). [Cloud computing services models - IaaS, PaaS, and SaaS explained](https://www.youtube.com/watch?v=36zducUX16w) [Video]. | [Transcript](#). Retrieved from <https://www.youtube.com/watch?v=36zducUX16w>

## Optional Resources

Use the Internet to access more information about the pros and cons of cloud computing.

- Ecourse Review. (n.d.). [Cloud computing pros and cons for business and IT professionals](https://ecoursereview.com/cloud-computing-pros-and-cons-for-business-it/). Retrieved from <https://ecoursereview.com/cloud-computing-pros-and-cons-for-business-it/>

### u01s1 - Learning Components

- Describe cloud computing.
- Explain cloud computing concepts, i.e., EC2 Instance, Elastic Beanstalk.
- Define IaaS, PaaS, and SaaS.

### u01s2 - Software Preparation and Technology Access

In this course, you will be using software and technology that is needed to complete designated activities and assignments. There is no additional cost for this software and technology. Some software packages will be made available to you at no additional cost through Capella's subscription with Microsoft, while other software packages are available for free download through open-source licensing.

Capella University requires learners to meet certain minimum [computer requirements](#). Please note that some software required for a course may exceed these minimum requirements. Check the requirements for the software you may need to download and install to make sure it will work on your device. Most software will require a Windows PC. If you use a Mac, refer to [Installing a Virtual Environment and Windows on a Mac](#).

The software and technologies below are strongly recommended to support you in completing the course objectives. If you have access to other tools that you believe may still meet the requirements of this course, please discuss your selected alternatives with your instructor.

If you use assistive technology or any alternative communication methods to access course content, please contact [DisabilityServices@Capella.edu](mailto:DisabilityServices@Capella.edu) with any access-related questions or to request accommodations.

Use of the following third party resource is strongly recommended to support you in completing the course objectives. If you have access to other tools that you believe may still meet course requirements or if you have any difficulties accessing this resource or completing the related assignments, please contact your course faculty member to discuss potential alternatives.

For this course, follow the instructions provided through the steps below to register for an account.

## Qwiklabs

As a part of this course, you will access official Amazon Web Services training labs through Qwiklabs. The labs you are required to complete will be linked in the courseroom. Some of the labs are free, and you will need to "pay" for some labs with credits that will be provided to you by the Capella QwikLabs Administrator. After you create your Qwiklabs account, credits will be made available to you. Please make sure you use the credits **ONLY** to access the assigned labs for the course.

Please follow these instructions carefully to get set up on Qwiklabs and check your credit balance:

1. Go to [Qwiklabs](#) and click **Join** in the upper right corner of the page.
2. Select **Join with Email**.
3. Complete the form using your Capella University email address.
4. Provide Capella University as the Company Name.

**Note:** You may receive an e-mail at this point inviting you to join. Please disregard if you have already done so.

To check your credits:

1. Sign in and click the user icon in the upper right corner.
2. Select **My Account** from the dropdown menu.
3. Click **Credits & Subscriptions** on the top of the menu column on the left and your credits will be displayed. If you have 0 credits, send an email to: [qwiklabs-admin@capella.edu](mailto:qwiklabs-admin@capella.edu) requesting lab credits for your course.

To use Qwiklabs, open the lab. Here are some important points to consider:

- The labs run best on either the Chrome or Firefox web browser.
- The window displays the following:
  - The credit cost of the lab.
  - The amount of time you will have to complete the lab.
  - The time anticipated to complete the lab.
  - The time you accessed the lab.
- **Each time you start a lab**, credits will be subtracted from your credit balance. Therefore, make sure you allocate sufficient time to complete the lab.
- Labs are designed to be completed in one attempt. You **may not** save your work and resume it later.
- You have been allocated sufficient credits to complete a lab multiple times, as needed.
- Note that each time you start a lab, whether you actually complete the lab or not, Qwiklabs generates an automatic email when the lab timer runs out. Be aware that such notification emails are **not** valid evidence of completing a lab.

If you need help, click the Help icon on the main Qwiklabs menu and review the items on Running a Lab.

If you have difficulty running a lab, visit the Qwiklabs community portal and submit a ticket at:

<https://qwiklab.zendesk.com>. You will receive a response within 24 hours.

If you encounter any difficulties in the download and installation process, post a detailed question in the Ask Your Instructor section of the course. Your instructor should be able to help you or point you in the right direction for the

answers you need.

## Additional Online Resources

The course materials you have procured include an access code for additional online resources. Follow the instructions below.

**Note:** As a Capella learner, you have access to IT online resources through Capella's [Skillsoft](#) subscription, where you can find helpful materials.

### u01d1 - Cloud Computing

ACME Inc. is considering a transition of all their physical servers and networking hardware maintained on site to virtual servers/virtual networking hardware maintained over the cloud. As network technician for ACME Inc., your supervisor has tasked you to provide a written summary of talking points to brief department leaders in the organization. For this unit's discussion topic, note in your talking points what cloud computing is, the various services that clients can obtain from cloud providers, and some common cloud terminology. For example, we call a physical server a *server*. However, a cloud provider such as Amazon would call a virtual server in the cloud an "Instance." Note the advantages and potential disadvantages for ACME Inc., about this potential migration of its network infrastructure to the cloud. Again, since most of these department managers have a non-IT background, it is important to explain these topics suited for a nontechnical audience.

Your initial discussion post must be submitted by 11:59 PM Thursday.

## Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. Remember to give credit to external sources in your post.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

u01d1 - Learning Components

- Describe cloud computing.
- Explain cloud computing concepts, i.e., EC2 Instance, Elastic Beanstalk.
- Define IaaS, PaaS, and SaaS.
- Writes in a clear, easy-to-read, scholarly tone.

## Unit 2 >> Cloud Storage

### Introduction

In Unit 1 we learned what cloud computing is as well as some basic cloud concepts. Unit 2 introduces cloud data storage concepts and tools.

There are two ways to look at cloud data storage, and these data storage views are not mutually exclusive. Data storage can be viewed as "hot" data, data used regularly, and "cold" data, data rarely used; however, data that must be maintained and archived. Cloud providers offer storage options to accommodate both "hot" and cold "data." Cloud data storage tools examined in this unit are Amazon's S3 Bucket and Amazon Glacier. Amazon's S3 is suited to "hot" data storage/backup requirements, whereas Glacier is more suited to "cold" data storage/backup requirements. Both tools offer a "pay as you go" fee based on how much data is stored in a bucket versus a flat rate fee.

In this unit you will learn how cloud data storage services can support a variety of organizational data storage needs for "hot" and "cold" data storage. Additionally, in the lab for this unit you will create a simple S3 Bucket using Amazon Web Services (AWS) that will enable you to apply cloud storage capabilities and begin developing a cloud infrastructure.

The outcomes for this unit are as follows:

- Explain how cloud storage can support a variety of organizational needs.
- Create an S3 Bucket using Amazon Web Services (AWS).
- Apply cloud storage concepts to begin to develop a cloud infrastructure.

### Learning Activities

#### u02s1 - Cloud Storage

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 2, "Amazon Simple Storage Service (Amazon S3) and Amazon Glacier Storage."

## Videos

Use the Internet to watch the videos titled: "Introduction to Amazon S3" and "What is Amazon Glacier?"

- Amazon Web Services. (n.d.). [Introduction to Amazon S3](https://docs.aws.amazon.com/AmazonS3/latest/dev/Introduction.html). Retrieved from <https://docs.aws.amazon.com/AmazonS3/latest/dev/Introduction.html>
- Amazon Web Services. (n.d.). [Introduction to Amazon Glacier](https://docs.aws.amazon.com/amazonglacier/latest/dev/introduction.html). Retrieved from <https://docs.aws.amazon.com/amazonglacier/latest/dev/introduction.html>

### u02s1 - Learning Components

- Explain how cloud storage can support a variety of organizational needs.
- Apply cloud concepts to begin to develop a cloud infrastructure.
- Create an S3 Bucket using Amazon Web Services (AWS).

### u02a1 - Creating a Simple Storage Service (S3) Bucket

## Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best in either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon S3](https://qwiklabs.com/catalog_lab/177). Retrieved from [https://qwiklabs.com/catalog\\_lab/177](https://qwiklabs.com/catalog_lab/177)

## Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 3 - Step 24 - Screenshot of the AWS Management Console.
2. Screenshot at the end of Task 4 - Step 43 - Screenshot of the Bucket Policy.

Write a 1-2 page double spaced paper summarizing your lab experience. In your lab summary, consider the following questions: 1) What potential benefit do you envision for your organization in adopting an S3 Storage solution? 2) What type(s) of data/documents maintained within your organization might benefit from a cloud storage solution?

Submit both documents, i.e., the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a

single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Create an S3 Storage Object.
- Describe the features of an S3 Storage Object.
- Create Rules for Version Control.
- Describe the features of Rules for Version Control.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### Course Resources

Qwiklabs. (n.d.). [Introduction to Amazon Simple Storage Service \(S3\)](https://qwiklabs.com/catalog_lab/177). Retrieved from [https://qwiklabs.com/catalog\\_lab/177](https://qwiklabs.com/catalog_lab/177)

Example Screenshot [PDF]

## u02d1 - Cloud Storage

ACME Sales Department has 200 sales representatives located in all US states and 10 countries. ACME has decided to move the Sales Department information to cloud storage to facilitate easier Internet access to sales and customer data any time, anywhere, using multiple web-based applications to support the sales process.

One potential issue is the possibility of duplicate files. With an organization as large as ACME's, the creation of duplicate files is common. What problems are created for ACME Sales by the generation of duplicate files? If you were ACME's database manager in charge of the new cloud storage project, what would you recommend to address the potential problems?

Your initial discussion post must be submitted by 11:59 PM Thursday.

## Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. Remember to give credit to external sources in your post.

Your responses must be submitted by 11:59 PM Sunday.

### Course Resources

Graduate Discussion Participation Scoring Guide

### u02d1 - Learning Components

- Communicate clearly to a non-technical audience.
- Explain how cloud storage can support a variety of organizational needs.
- Design Rules and Criteria for a Storage Bucket

## Unit 3 >> Amazon EC2 Instances and Virtual Private Cloud

### Introduction

In Unit 3 we will explore Elastic Cloud (EC) Computing solutions. Unlike the term "scalability" which refers to growth and expansion, elasticity is a more inclusive term referring to both growth and reduction of services based on demand, scaling up and down as needed.

Also in this unit, we will explore what a virtual private cloud is. In short, a virtual private cloud is a virtual network with routers and switches created over the cloud on a service provider's platform. We will examine various cloud architectures/diagrams provided in your textbook. Additionally, in the lab for this unit you will create an Amazon EC2 Instance (virtual server) using Amazon Web Services (AWS) that will enable you to apply cloud service capabilities and begin the process for developing a cloud infrastructure to meet organizational needs.

The outcomes for this unit are as follows:

- Explain how cloud virtual servers can support a variety of organizational needs.

- Create an EC2 Instance using Amazon Web Services (AWS).
- Apply cloud concepts to begin to develop a cloud infrastructure.

## Learning Activities

### u03s1 - Amazon EC2 Instances and Virtual Private Cloud

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 3, "Amazon Elastic Compute Cloud (Amazon EC2) and Amazon Elastic Block Store (Amazon EBS)."
- Chapter 4, "Amazon Virtual Private Cloud (Amazon VPC)."
- Example the figures and diagrams 14.1 through 14.6 in Chapter 14.

### u03s1 - Learning Components

- Apply cloud concepts to begin to develop a cloud infrastructure.
- Explain how cloud virtual servers can support a variety of organizational needs.
- Create an EC2 Instance using Amazon Web Services (AWS).

### u03a1 - Creating an EC2 Instance (Virtual Server)

## Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best in either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon EC2](https://qwiklabs.com/catalog_lab/791). Retrieved from [https://qwiklabs.com/catalog\\_lab/791](https://qwiklabs.com/catalog_lab/791)

## Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 1 - Step 23 - Screenshot of the newly created EC2 Instance.
2. Screenshot at the end of Task 4 - Step 53 - Screenshot of the resized EC2 Instance.

Write a 1-2 page double spaced paper summarizing your lab experience. Consider the following questions:

1. What are the advantages of a virtual server maintained over the cloud vs. a physical server located on premises?
2. How difficult was the configuration of the virtual server as compared to a physical server?

Submit both documents, i.e., the screenshot and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Create an EC2 Instance.
- Describe an EC2 Instance.
- Create rules for an EC2 Instance.
- Describe rules for an EC2 Instance.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### Course Resources

Qwiklabs. (n.d.). [Introduction to Amazon EC2](https://qwiklabs.com/catalog_lab/791). Retrieved from [https://qwiklabs.com/catalog\\_lab/791](https://qwiklabs.com/catalog_lab/791)

### Example Screenshot [PDF]

## u03d1 - EC2 Instances and Virtual Private Cloud

ABC Company is considering moving its network infrastructure to the cloud. Everything from virtual switches, routers, servers, and security devices would be managed remotely and virtually. Another name for a virtual server on a cloud provider's platform is Amazon's "EC2 Instance."

You have been tasked to provide a briefing to company leadership explaining the benefits of this transition, specifically the benefits of an EC2 Instance vs. a physical server located at ABC Company. How would you note the potential benefits of EC2 Instances to company leadership? In your response, you may also consider any concerns with EC2 Instance deployment.

Your initial discussion post must be submitted by 11:59 PM Thursday.

## Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. Remember to give credit to external sources in your post.

Your responses must be submitted by 11:59 PM Sunday.

### Course Resources

Graduate Discussion Participation Scoring Guide

### u03d1 - Learning Components

- Communicate clearly to a non-technical audience.
- Explain how cloud virtual servers can support a variety of organizational needs.

## Unit 4 >> Elastic Load Balancing and Auto Scaling

### Introduction

In Unit 4 we will explore two of the greatest advantages of utilizing cloud computing services: load balancing and auto scaling solutions.

Imagine if we had 3 EC2 Instances (web virtual servers) and we wanted to distribute the workload equally among them. This is where load balancing comes in. We can load balance using a variety of options: by IP address, layer 4 protocols, and even TCP/UDP port numbers. The possibilities are endless.

Auto scaling allows your network and your servers to expand or reduce based on demand. Just like the term "auto" implies, this can be done automatically.

This unit includes two labs: "Introduction to Elastic Load Balancing" and "Introduction to Amazon EC2 Auto Scaling." These labs use Amazon Web Services (AWS) that will enable you to apply cloud service capabilities and begin the process for developing a cloud infrastructure to meet organizational needs.

The outcomes for this unit are as follows:

- Explain how load balancing can support a variety of organizational needs.
- Create a Load Balancer using Amazon Web Services (AWS).
- Apply cloud concepts to begin to develop a cloud infrastructure.

**NOTE:** Since this unit contains 2 lab assignments, there will be no discussion topic for Unit 4.

## Learning Activities

### u04s1 - Elastic Load Balancing and Auto Scaling

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 5, "Elastic Load Balancing, Amazon CloudWatch, and Auto Scaling."

### u04s1 - Learning Components

- Apply cloud concepts to begin to develop a cloud infrastructure.
- Explain how load balancing can support a variety of organizational needs.
- Create a Load Balancer using Amazon Web Services (AWS).

### u04a1 - Elastic Load Balancing

## Assignment Overview

For this assignment, you will log in to your Qwiklabs account that you created in Unit 1 by clicking the link in the assignment Resources or logging in to Qwiklabs and searching for the lab by name. **Note:** The labs run best in

the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab (linked in Resources):

- Qwiklabs. (n.d.). Working with elastic load balancing. Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/155](https://amazon.qwiklabs.com/catalog_lab/155)

## Assignment Instructions

You will take two screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 3 - Step 32 - Screenshot of testing the Load Balancer default functionality.
2. Screenshot at the end Task 4 - Step 43 - Screenshot of exploring the metrics from Cloudwatch.

Write a 1–2 page double-spaced paper summarizing your lab experience. Consider the following: What type(s) of traffic (that is, TCP versus UDP, HTTP versus HTTPS) might be suited for load balancing within your organization?

Submit the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the two screenshots into your 1–2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria; please refer to the scoring guide for this assignment:

- Create an Elastic Load Balancer.
- Describe an Elastic Load Balancer.
- Recommend Elastic Load Balancing Services to support organizational needs.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and

format.

- **Font and font size:** Times New Roman, 11 pt.

## Course Resources

Example Screenshot [PDF]

[Working With Elastic Load Balancing](#)

## u04a2 - EC2 Auto Scaling

### Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best on either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon EC2 Auto Scaling](https://qwiklabs.com/catalog_lab/233). Retrieved from [https://qwiklabs.com/catalog\\_lab/233](https://qwiklabs.com/catalog_lab/233)

### Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 2 - Step 20 - Screenshot of the Creation of an Auto Scaling Group.
2. Screenshot at the end of Task 4 - Step 28 - Screenshot of the Activity History Auto Scaling Tab.

Write a 1-2 page double spaced paper summarizing your lab experience. Consider the following:

1. Are there peak times/usage (to includes types of data) that would require an auto-scaling solution within your organization?
2. What are the advantages of a cloud auto-scaling solution vs. managing a physical device on premises for auto-scaling?

Submit both documents, i.e., the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Create an Auto Scaling solution.
- Describe an Auto Scaling solution.
- Recommend Auto Scaling solutions to support organizational needs.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### Course Resources

Qwiklabs. (n.d.). [Introduction to Amazon EC2 Auto Scaling](https://qwiklabs.com/catalog_lab/233). Retrieved from [https://qwiklabs.com/catalog\\_lab/233](https://qwiklabs.com/catalog_lab/233)

Example Screenshot [PDF]

## Unit 5 >> Identity and Access Management: Database Solutions

### Introduction

In Unit 5 we will explore Identity and Access Management and Database Solutions for the Cloud and Database Solutions.

Amazon's Identity and Access Management (IAM) allows us to implement end user security over the cloud. In addition to people, security can be assigned to programs to determine at what level manipulation to the infrastructure can occur.

Cloud providers such as Amazon provide a myriad of database solutions. These solutions can vary by complexity and organizational needs.

This unit does not have a lab.

The outcomes for this unit are as follows:

- Recommend an organizational-wide cloud security solution.
- Evaluate the benefits of managing your database over the cloud.

## Learning Activities

### u05s1 - Identity and Access Management: Database Solutions

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 6, "AWS Identity and Access Management (IAM)."
- Chapter 7, "Databases and AWS."

Use the internet to read:

- Amazon Web Services. (n.d.). Purpose Built Database for all your Application Needs. Retrieved from <https://aws.amazon.com/products/databases/>
- Amazon Web Services. (n.d.). Understanding how Identity and Access Management (IAM) Works. Retrieved from <https://docs.aws.amazon.com/IAM/latest/UserGuide/intro-structure.html>

### u05s1 - Learning Components

- Recommend an organizational-wide cloud security solution.
- Evaluate the benefits of managing your database over the cloud.

### u05a1 - Identity and Access Management: Database Solutions

## Assignment Overview

For this assignment, you will use your current organization or fictitious organization and analyze how you would manage your current users, groups, and programs with IAM; in addition, choose an Amazon Database Solution that best meets your organizational needs.

## Assignment Instructions

Write a 4-5 page, double spaced, 2-part paper: Part 1: Identity and Access Management (IAM); and Part 2: Database Solutions. In addition to the resources provided in the study for this unit, feel free to use other scholarly and technical resources for IAM and Cloud Database Solutions. Remember to give credit to external sources. Submit your paper to the assignment for this unit.

**Submit** your paper by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe a Managed Cloud database platform.
- Recommend a Managed Cloud database platform.
- Evaluate the effectiveness of an Identity and Access Management solution for a cloud-based network.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 4–5 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### u05d1 - Identity and Access Management (IAM) and Cloud Database Solutions

Senior leadership at XYZ Enterprises has decided to move its entire network and data to a cloud provider. The data maintained by XYZ Enterprises is sensitive and must be kept secure.

Two options for remotely managing data solutions are Amazon's Identity and Access Management or Amazon's Database Solutions. Choose one of these options and justify how sensitive data maintained in the cloud would be secured. In your response, you may include any potential concerns as well. Feel free to use outside, scholarly sources to justify your solution.

Your initial discussion post must be submitted by 11:59 PM Thursday.

## Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. Remember to give credit to external sources in your discussion post.

Your responses must be submitted by 11:59 PM Sunday.

### Course Resources

Graduate Discussion Participation Scoring Guide

#### u05d1 - Learning Components

- Communicate clearly to a non-technical audience.
- Recommend an organizational-wide cloud security solution.
- Evaluate the benefits of managing your database over the cloud.

## Unit 6 >> Cloud Application Services and Machine Learning

### Introduction

In Unit 6 we will explore application and mobile services from the cloud.

Amazon's Simple Queue Services and Machine Learning offer a great way to store application messages on a scalable infrastructure and make real-time predictions. You can even build applications that coordinate work among different components. Push emails and text messages can be accomplished through Amazon applications such as Simple Notification Service (SNS).

This unit covers several applications for day-to-day management of a network over the cloud. Additionally, in the lab for this unit you will generate an Amazon Machine Learning model, and test and shape the model and then try real-time predictions.

The outcomes for this unit are as follows:

- Evaluate the myriad of application services offered by a cloud provider.

- Generate an Amazon Machine Learning model using Amazon Web Services (AWS).
- Apply cloud concepts to deploy a cloud computing infrastructure.

## Learning Activities

### u06s1 - Cloud Application Services and Machine Learning

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 8, "SQS, SWF, and SNS."

Use the Internet to read:

- Amazon Web Services. (n.d.). [Basic Amazon SQS Architecture](https://docs.aws.amazon.com/AWSSimpleQueueService/latest/SQSDeveloperGuide/sqs-basic-architecture.html). Retrieved from <https://docs.aws.amazon.com/AWSSimpleQueueService/latest/SQSDeveloperGuide/sqs-basic-architecture.html>
- Amazon Web Services. (n.d.). [Amazon Machine Learning Product Details](https://aws.amazon.com/aml/details/). Retrieved from <https://aws.amazon.com/aml/details/>
- Amazon Web Services. (2010, Apr 7). [Introducing the Amazon Simple Notification Service \[Blog post\]](https://aws.amazon.com/blogs/aws/introducing-the-amazon-simple-notification-service/). Retrieved from <https://aws.amazon.com/blogs/aws/introducing-the-amazon-simple-notification-service/>

### u06s1 - Learning Components

- Evaluate the effectiveness of Implementing a Cloud-Based Solution for your Organization
- Apply cloud concepts to deploy a cloud computing infrastructure.
- Generate an Amazon Machine Learning model using Amazon Web Services (AWS).

### u06a1 - Introduction to Amazon Machine Learning

## Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best in either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon Machine Learning](https://amazon.qwiklabs.com/catalog_lab/252). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/252](https://amazon.qwiklabs.com/catalog_lab/252)

## Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 3 - Step 25 - Screenshot of the Creation of a Machine Learning Model.
2. Screenshot at the end of Task 5 - Step 39 - Screenshot of Trying Your Combinations of the Machine Model.

Write a 1-2 page double spaced paper summarizing your lab experience. Consider the following: How can machine learning enhance network connectivity for customers who access your organization's EC2 instances?

Submit both documents, i.e., the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe cloud application services for a cloud-based network.
- Evaluate the effectiveness of cloud application services for a cloud-based network.
- Describe machine learning for a cloud-based network.
- Evaluate the effectiveness of machine learning for a cloud-based network.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

## Course Resources

[Introduction to Amazon Machine Learning](#)

Example Screenshot [PDF]

### u06d1 - Amazon Application Services

You are the Chief Information Officer for an organization whose primary mission is to develop software suited for health care organizations. Senior leadership has agreed to your proposal to allow your software developers the ability to design and test their applications over a cloud provider's platform. In your proposal, you noted that Amazon offers a variety of software development solutions to meet the organization's needs.

For this unit's discussion, evaluate an Amazon software service of your choice and justify the rationale for choosing this service, including how the service would improve the development and testing of new software related to health care organizations.

Your initial discussion post must be submitted by 11:59 PM Thursday.

### Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. In your discussion post, remember to give credit to your external sources.

Your responses must be submitted by 11:59 PM Sunday.

## Course Resources

Graduate Discussion Participation Scoring Guide

### u06d1 - Learning Components

- Communicate clearly to a non-technical audience.
- Apply cloud concepts to deploy a cloud computing infrastructure.
- Evaluate the myriad of application services offered by a cloud provider.

## Unit 7 >> Domain Name Service and Amazon Route 53

### Introduction

Domain Name Service (DNS) is a common, everyday networking term. We have learned about and practiced DNS in prior courses and training sessions, as well as day-to-day DNS use via our web browsers, throughout our careers.

For Unit 7, we will explore Amazon Route 53, a service to ensure end users (your customers) are routed to the correct web applications over your cloud network. Additionally, in the lab for this unit you will create, edit, and delete simple DNS records within a hosted zone, and create and test simple health check and associated failover records.

The outcomes for this unit are as follows:

- Evaluate the effectiveness provided by a routing service.
- Create DNS records using the Amazon Web Service (AWS) tool, Amazon Route 53.
- Apply cloud concepts to deploy a cloud computing infrastructure.

### Learning Activities

#### u07s1 - Domain Name Service and Amazon Route 53

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 9, "Domain Name System (DNS) and Amazon Route 53."

Use the internet to read:

- Amazon Web Services. (n.d.). [Amazon Route 53](https://aws.amazon.com/route53/). Retrieved from <https://aws.amazon.com/route53/>

#### u07s1 - Learning Components

- Evaluate the effectiveness provided by a routing service.
- Apply cloud concepts to deploy a cloud computing infrastructure.
- Create DNS records using the Amazon Web Service (AWS) tool, Amazon Route 53.

#### u07a1 - Domain Name Service and Amazon Route 53

## Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best on either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon Route 53](https://amazon.qwiklabs.com/catalog_lab/235). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/235](https://amazon.qwiklabs.com/catalog_lab/235)

## Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 2 - Step 24 - Screenshot of Creation of DNS Records.
2. Screenshot at the end of Task 5 - Step 57 - Screenshot of Health Checking the DNS Server and Checking the Failover.

Write a 1-2 page double spaced paper summarizing your lab experience. Consider the following:

1. Imagine your organization has several EC2 instances located worldwide in several geographical regions. How can Amazon's Route 53 enhance the online experience in terms of speed and access for your customers located worldwide?
2. In addition, how can Route 53 improve access to S3 buckets and load balancers as well?

Submit both documents, i.e., the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe cloud application services for a cloud-based network.
- Evaluate the effectiveness of cloud application services for a cloud-based network.
- Describe how to route users to cloud-based resources.
- Evaluate the effectiveness of routing users to cloud-based resources.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### Course Resources

Qwiklabs. (n.d.). [Introduction to Amazon Route 53](https://amazon.qwiklabs.com/catalog_lab/235). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/235](https://amazon.qwiklabs.com/catalog_lab/235)

Example Screenshot [PDF]

### u07d1 - Domain Name Service and Amazon Route 53

As senior network engineer for ACME Inc., you are responsible for the daily management and operation of all virtual web servers located in several geographical areas on a cloud provider's platform. During a recent meeting with your CIO, it was noted that customers in Asia and Europe are experiencing slow responses times and that these slow response rates are coming from a virtual web server located in the Midwest region of the United States.

You have decided to explore options for deploying EC2 Instances, Amazon's Domain Name Service features, and Route 53 as possible solutions to the slow response rates. In your response, provide a summary of your solution(s) that would benefit your customers in Asia and Europe. Consider latency (delay), failover, and redundancy in your response.

Your initial discussion post must be submitted by 11:59 PM Thursday.

### Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. Remember to cite external sources in your discussion post.

Your responses must be submitted by 11:59 PM Sunday.

## Course Resources

### Graduate Discussion Participation Scoring Guide

#### u07d1 - Learning Components

- Evaluate Amazon Route 53 for Web Application Management
- Evaluate Domain Name Services

## Unit 8 >> Elasticity and Content Delivery Services

### Introduction

In Unit 8 we will explore Amazon's ElastiCache services and additional key cloud computing services with Amazon's virtual private cloud. As noted earlier in the course, "scalability" refers to the ability to expand, whereas "elasticity" (a much stronger term) refers to the ability to both grow and shrink as an on-demand service. This unit focuses on additional key cloud computing services in 4 key categories:

1. Storage and content delivery.
2. Security.
3. Analytics.
4. DevOps.

Additionally, this unit has two labs. In the first lab for this unit "Introduction to Amazon Elastic Block Store (EBS)" you will create an Amazon Elastic Block Store (EBS) volume, attach it to an Amazon EC2 instance, take a snapshot of the volume, and increase the size and Input/Output Operations Per Second (IOPS). In the second lab for this unit "Introduction to Amazon Virtual Private Cloud (VPC)" you will use the Amazon VPC wizard to create a VPC, attach an Internet Gateway, add a subnet and then define routing for the VPC so that traffic can flow between the subnet and the Internet gateway.

The outcomes for this unit are as follows:

- Evaluate the effectiveness of Amazon's Elastic Block Store (EBS).
- Evaluate the importance of designing analytical solutions.
- Create an Amazon Elastic Block Store (EBS) volume using Amazon Web Services (AWS).
- Create an Amazon Virtual Private Cloud (VPC) using Amazon Web Services (AWS).
- Apply cloud concepts to deploy a cloud computing infrastructure.

**NOTE:** Since there are two labs to complete in Unit 8, there will be no discussion topic for this unit.

## Learning Activities

### u08s1 - Elasticity and Content Delivery Services

## Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 10, "Amazon ElastiCache."
- Chapter 11, "Additional Key Services."

### u08s1 - Learning Components

- Evaluate the effectiveness of Amazon's Elastic Block Store (EBS).
- Apply cloud concepts to deploy a cloud computing infrastructure.
- Evaluate the importance of architecting analytical solutions.
- Create an Amazon Virtual Private Cloud (VPC) using Amazon Web Services (AWS).
- Create an Amazon Elastic Block Store (EBS) volume using Amazon Web Services (AWS).

### u08a1 - Amazon Elastic Block Store (EBS)

## Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best on either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon Elastic Block Store \(EBS\)](https://amazon.qwiklabs.com/catalog_lab/102). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/102](https://amazon.qwiklabs.com/catalog_lab/102)

## Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 2 - Step 14 - Screenshot of Attaching an EBS Volume to an EC2 Instance.
2. Screenshot at the end of Task 4 - Step 24 - Screenshot of Modifying an EBS Volume.

Write a 1-2 page double spaced paper summarizing your lab experience. What potential advantages do you see by replicating Amazon EBS volumes automatically within an availability zone? Describe any potential cost savings when implementing Amazon EBS solutions. Submit both documents, i.e., the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe cloud application services for a cloud-based network.
- Evaluate the effectiveness of cloud application services for a cloud-based network.
- Describe how to employ elastic block store solutions.
- Evaluate the effectiveness of employing elastic block store solutions.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### Course Resources

Qwiklabs. (n.d.). [Introduction to Amazon Elastic Block Store \(EBS\)](https://amazon.qwiklabs.com/catalog_lab/102). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/102](https://amazon.qwiklabs.com/catalog_lab/102)

Example Screenshot [PDF]

## u08a2 - Amazon Virtual Private Cloud (VPC)

## Assignment Overview

For this assignment, you will log into your Qwiklabs account that you created in Unit 1, either by clicking the link in the assignment Resources or logging into Qwiklabs and searching for the lab by name. **Note:** The labs run best in either the Chrome or Firefox web browser. Please plan to complete your lab in one session, as your work is not saved when you exit the lab.

For this assignment you will access the following lab:

- Qwiklabs. (n.d.). [Introduction to Amazon Virtual Private Cloud \(VPC\)](https://amazon.qwiklabs.com/catalog_lab/200). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/200](https://amazon.qwiklabs.com/catalog_lab/200)

## Assignment Instructions

You will take 2 screenshots during this lab and copy them into a MS Word document (.doc) or PowerPoint (.ppt). The screenshots should include your Qwiklab ID and a date and time stamp located on your desktop image. See the Example Screenshot [PDF] in the assignment Resources.

1. Screenshot at the end of Task 2 - Step 13 - Screenshot of Creating an Amazon VPC.
2. Screenshot at the end of Task 3 - Step 25 - Screenshot of Exploring your VPC.

Write a 1-2 page double spaced paper summarizing your lab experience. Submit both documents, i.e., the screenshots and the paper summarizing your lab experience, in the assignment for this unit. **NOTE:** You may embed the 2 screenshots into your 1-2 page narrative and submit a single document if you wish.

**Submit** your assignment documents by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Compare and contrast the differences between a Virtual Private Cloud and a Traditional Physical Network Infrastructure.
- Describe the role of network architecture when employing a Virtual Private Cloud.
- Evaluate the role of network architecture when employing a Virtual Private Cloud.
- Design a cloud solution for an organization.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Lab output:** Lab screenshots with your Qwiklabs ID and a date stamp.
- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.

- **Paper length:** Minimum of 2–3 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

#### Course Resources

Qwiklabs. (n.d.). [Introduction to Amazon Virtual Private Cloud \(VPC\)](https://amazon.qwiklabs.com/catalog_lab/200). Retrieved from [https://amazon.qwiklabs.com/catalog\\_lab/200](https://amazon.qwiklabs.com/catalog_lab/200)

Example Screenshot [PDF]

## Unit 9 >> Cloud Security and Compliance Issues

### Introduction

In Unit 9 we will examine cloud security in-depth, going beyond the Identity and Access Management we covered earlier.

In addition to a traditional security approach, cloud security examines a "shared responsibility model" between client and vendor. This unit covers Amazon administration and security services as well as ways to mitigate denial of service (DOS) attacks over the cloud. Also in this unit, Risk and Compliance issues are discussed to include Amazon security attributes and design patterns.

Outcomes for this unit are as follows:

- Describe a security and risk management policy for an organization.
- Define a shared responsibility model between the client and cloud computing vendor.
- Communicate complex policy issues in a manner that is suited for a non-technical audience.

**NOTE:** This unit does not have a lab.

### Learning Activities

#### u09s1 - Cloud Security and Compliance Issues

### Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 12, "Security on AWS."
- Chapter 13, "AWS Risk and Compliance."

u09s1 - Learning Components

- Communicate complex policy issues in a manner that is suited for a non-technical audience.
- Describe a security and risk management policy for an organization.
- Define a shared responsibility model between the client and cloud computing vendor.

### u09a1 - Cloud Security, Risk Management, and Compliance

## Assignment Overview

For this assignment, you will use your current organization or a fictitious organization. Describe cloud security and compliance issues an organization may experience for a given cloud solution. Analyze how a risk and compliance outlined plan addresses cloud security and compliance issues, and could be applied to the organization. Creativity is encouraged.

## Assignment Instructions

Write a 3-5 page double spaced paper. In addition to resources provided in the study for this unit, feel free to use other scholarly and technical resources for cloud security and compliance. Remember to give credit to external sources. Submit your paper to the assignment for this unit.

**Submit** your paper by 11:59 on Sunday of this week.

## Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe how to implement a cloud solution for an organization.
- Describe cloud security and compliance issues an organization may experience.
- Analyze how a risk and compliance outlined plan for cloud computing services addresses cloud security and compliance issues.
- Describe how a risk and compliance outlined plan can be applied in an organization.
- Demonstrate a critical assessment of cloud computing features and services including potential benefits and challenges of implementation.
- Use style and vocabulary generally appropriate to the message and intended audience.

## Assignment Requirements

- **Communication:** Communicate in a manner that is scholarly, professional, respectful, and consistent with expectations for professional practice in technology. Assignment submission must be original work that reflects critical thinking with clear organization of concepts and ideas.
- **Paper length:** Minimum of 3–5 pages, not including the title page or reference page.
- **Resources:** At least three scholarly resources. Include a reference page at the end of the paper.
- **APA guidelines:** Double-spaced paragraph formatting in the body of the paper. When appropriate, use APA-formatted headings. Resources and citations are formatted according to current APA style and format.
- **Font and font size:** Times New Roman, 11 pt.

### u09d1 - Cloud Security, Risk Assessment, and Compliance

As Chief Information Security Officer (CISO) for XYZ Inc., you have been tasked by the CIO to develop a risk assessment of moving your organization's physical infrastructure over to a cloud computing provider. You have decided to examine Amazon's risk assessment strategies for lines of responsibility and compliance issues when migrating to a cloud-based network. These risk assessment strategies are the Shared Responsibility Model and Amazon's Risk and Compliance Program. Using these two strategies, briefly write a risk assessment plan that includes failover, redundancy, as well as lines of responsibility between XYZ and the cloud provider.

You are encouraged to use outside, scholarly sources on the above topics.

Your initial discussion post must be submitted by 11:59 PM Thursday.

## Response Guidelines

Return to the discussion by the end of the week to read and review the posts of your peers. Does anyone else's topic coincide or complement your own? Post a comment and add questions to further explore the experiences of your classmates. Also, in your response, comment on a topic described by a peer. Remember to give credit to external sources in your post.

Your responses must be submitted by 11:59 PM Sunday.

Course Resources

Graduate Discussion Participation Scoring Guide

## u09d1 - Learning Components

- Communicate complex policy issues in a manner that is suited for a non-technical audience.
- Describe a security and risk management policy for an organization.
- Define a shared responsibility model between the client and cloud computing vendor.

## Unit 10 >> Designing a Cloud Network

### Introduction

Per the authors in the textbook, if you design for failure then nothing fails. When we architect and build a virtual private network over the cloud, we should consider fault tolerance and redundancy. Scaling and elasticity aid in achieving a "nothing fails" mindset for those who migrate to the cloud.

For Unit 10, you will design a cloud network from three perspectives:

1. Infrastructure as a Service.
2. Platform as a Service.
3. Software as a Service.

Throughout this course you have learned that migrating services to the cloud can offer organizational benefits that are not only cost effective, but also highly secure. In this final unit of the course, you will read Chapter 14 and submit an assignment to design a cloud network. This unit does not have a lab.

Outcomes for this unit are as follows:

- Design a cloud network for deployment in an organization.
- Describe how to implement cloud services to migrate an organization to a cloud computing architecture.

### Learning Activities

## u10s1 - Designing a Cloud Network

### Readings

From the Capella University Library:

Use your [AWS Certified Solutions Architect Official Study Guide: Associate Exam](#) text to read the following:

- Chapter 14, "Architecture Best Practices."

Use the internet to read:

- Cardenas, S., (2017). Building a Modular and Scalable Virtual Network Architecture with Amazon VPC: Quick Start Reference Deployment. Amazon Web Services.

## u10s1 - Learning Components

- Design a cloud network for deployment in an organization.
- Describe how to implement cloud services to migrate an organization to a cloud computing architecture.

## u10a1 - Designing a Cloud Network

### Assignment Overview

For this assignment, you will use your current organization or fictitious organization and write a proposal to migrate to the cloud and design a cloud network. Organize your response by Infrastructure as a Service, Platform as a Service, and Software as a Service. To address redundancy and fault tolerance, include elasticity and scalability in your proposal. In addition, attach a simple cloud diagram in your response (examples are provided in Chapter 14 of your textbook). Your organization can be real or fictitious...creativity is encouraged.

### Assignment Instructions

Write a 5-7 page double spaced paper. In addition to resources provided in the study for this unit, feel free to use other scholarly/technical resources for writing proposals for migrating to the cloud and designing a cloud network. Remember to give credit to your external sources both in the body of the text and in the references section at the end of the narrative. Submit your paper to the assignment for this unit.

**Submit** your paper by 11:59 on Sunday of this week.

### Assignment Criteria

Your assignment must meet this criteria, please refer to the scoring guide for this assignment.

- Describe how to implement "Infrastructure as a Service" to migrate an organization to a cloud computing architecture.
- Describe how to implement "Platform as a Service" to migrate an organization to a cloud computing architecture.
- Describe how to implement "Software as a Service" to migrate an organization to a cloud computing architecture.
- Describe how to implement Elasticity/Scalability to migrate an organization to a cloud computing architecture.
- Describe how to implement a risk and compliance outlined plan for cloud computing services to migrate an organization to a cloud computing architecture.
- Design a Cloud-Network-Based Diagram to migrate an organization to a cloud computing architecture.
- Use style and vocabulary generally appropriate to the message and intended audience.