Fundamental Cloud Concepts in AWS

Guided Notes

I am excited that you are on the journey to get your AWS Certified Cloud Practitioner certification. This guided outline is meant to complement the video course. Here are a few tips to help you get the most out of these resources:

1. Print this out before you start the video course.
2. Follow along with the course and fill out areas in this document as you watch the course. You'll notice that the module names in the course are the bold headings here in these notes. In addition, clips in the module have their titles in this document too. Not all clips have notes.
3. Review your notes against the completed notes that can be found in the exercise files.
4. Keep this document after you finish the course as a part of the materials you will use to study for the exam.

Remember, this course is just the first step in your journey to achieve this certification. Follow along with the remainder of courses in this path, and then register for the exam.

Don't forget to reach out on Twitter and LinkedIn to let me know how you are doing along the way.

Understanding Cloud Computing

Learning Outcomes

- Setup an AWS Test Account
  - While this isn't required for the exam, it will prove to be helpful throughout the entire path
- Understand Traditional Data Centers
  - Know the challenges that exist when working with traditional data centers
- Understand Cloud Computing
  - You should be able to compare and contrast cloud computing with traditional data centers
  - You should understand the following terms:
    - Elasticity
    - Reliability
    - Agility
  - You should understand the differences between the following cloud computing models:
    - Infrastructure as a Service (IaaS)
    - Platform as a Service (PaaS)
    - Software as a Service (SaaS)
  - Know the different cloud deployment models:
    - Public Cloud
    - Private Cloud
    - Hybrid Cloud

Links You'll Need

- AWS Home Page (to sign up for an account)
- AWS Console

Setting up an AWS Account

While this portion isn't required for the test, it can be helpful in testing out the services and concepts in this learning path.

After setting up your account in the video, make sure to follow all of the steps to the end to create a billing alarm. These steps are detailed below:

1. From the AWS Console, select the dropdown from your username and then select **My Billing Dashboard**.

2. From the left navigation select **AWS Budgets**.
3. Select the option to **Create Budget**.
4. Make sure **Cost Budget** is selected and then select **Set Your Budget**.
5. Enter a name and budgeted amount and then select **Configure Alerts**.
6. Enter an alert threshold and your email address and select **Confirm Budget**.

Traditional Data Centers

Traditional data centers present challenges for organizations:

1. Large up-front investment
2. *Forecasting demand is difficult*
3. *Slow to deploy new data centers and servers*
4. Maintaining data centers is expensive
5. You own all of the security and compliance burden

Benefits of Cloud Computing

AWS lists six key Advantages of Cloud Computing:

1. Trade *capital* expenses for *variable* expenses
2. Benefit from *massive economies of scale*
3. Stop guessing *capacity*
4. Increase speed and *agility*
5. Stop spending money maintaining data centers
6. Go global in *minutes*

"*Elasticity* is the ability to acquire resources as you need them and release resources when you no longer need them. In the cloud, you want to do this

automatically. ”

Well-Architected Framework, Amazon Web Services

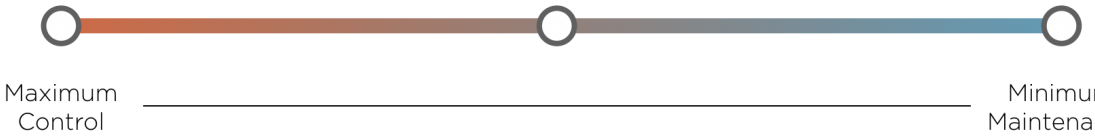
Types of Cloud Computing

Write the definition of Cloud Computing provided by AWS:

Cloud computing is the on-demand delivery of compute power, database storage, applications, and other IT resources through a cloud services platform via the Internet with pay-as-you-go pricing.

Enter the three different cloud computing models discussed in the clip:

Infrastructure as a Service (IaaS) ***Platform as a Service (PaaS)*** ***Software as a Service (SaaS)***



Enter the name of each cloud computing deployment model below:

Public Cloud Deployed onto a public cloud provider like AWS, Microsoft Azure or the Google Cloud Platform.

On-premises (Private Cloud) Deployed in a private data center using a cloud-like platform provided by vendors like VMWare.

_____ Deployed with a mix of the previous two options using both a provided like AWS alongside a cloud-like platform in a private data center.

Hybrid Cloud

Scenarios

The following scenarios are presented in the course as a way to explore your understanding of the module. Include your answer here in this outline, as well as your notes on the solution to each scenario.

SCENARIO 1

- Roger's company runs several production workloads in its data center
- They are using VMWare to manage infrastructure in their data center
- They want to use AWS and integrate it with their data center for new workloads
- Which cloud deployment model would his company be following?

What's Your Answer: *Hybrid Cloud*

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 2

- Eliza's company is trying to decide whether to fund a new line of business
- Eliza's team is looking to monetize a new emerging technology
- This new line of business will require new infrastructure
- What benefit of cloud computing would be most relevant to her company?

What's Your Answer: *Pay as you go*

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 3

- Jennifer is the CTO at an insurance company
- They are considering moving to the cloud instead of co-locating servers
- They want to make sure they have maximum control of the cloud servers
- Which cloud computing model would they need to leverage?

What's Your Answer: *Infrastructure as a Service (IaaS)*

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

Module Wrap Up

Take a minute to write down any areas from this module that you don't fully understand or where you still have questions:

AWS Global Infrastructure

Learning Outcomes

- Be able to list the three key elements of AWS Global Infrastructure:
  - AWS Regions
    - Understand what constitutes a region
  - AWS Availability Zones
    - Understand what makes up an availability zone
  - AWS Local Zones
    - Understand how local zones relate to AWS Regions
  - AWS Edge Locations
    - Know which services leverage edge locations
- Understand how each of these aspects factors into solutions built on the platform

Links You'll Need

- AWS Infrastructure Visualization
- AWS Regions and Availability Zones

Overview

The primary elements of AWS Global Infrastructure are:

1. ***AWS Regions***
2. ***AWS Availability Zones***
3. ***AWS Local Zones***
4. ***AWS Edge Locations***

AWS Regions and Availability Zones

An AWS ***Region*** represents a cluster of data centers in a specific geographic location.

An AWS ___Availability Zone___ consists of one or more data centers.

The primary purpose of an AWS Availability Zones is to:

Enable high-availability

AWS Local and Wavelength Zones

AWS ___Local___ ___Zones___ place compute, storage, database, and other select AWS services closer to end-users. Each is an extension of an AWS Region.

___Wavelength___ ___Zones___ are AWS infrastructure deployments that embed AWS compute and storage services within communications service providers' (CSP) 5G networks.

AWS Edge Locations

The acronym CDN stands for ___Content___ ___Delivery___ ___Network___.

AWS utilizes Edge Locations for the services ___Amazon CloudFront___ and ___Amazon Route 53___.

The primary purpose of an AWS Edge Locations it to:

Serve content where it is closest to end users

Scenarios

The following scenarios are presented in the course as a way to explore your understanding of the module. Include your answer here in this outline, as well as your notes on the solution to each scenario.

SCENARIO 1

- Jane's company is looking to transition to AWS
- They are starting with a few workloads
- It is a requirement to store backup data in multiple geographic areas
- Which element of AWS global infrastructure will best suit this need?

What's Your Answer: ***AWS Regions***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 2

- Tim's company serves content through their site to users around the globe
- They are looking to optimize performance to users around the world
- They want to leverage a Content Delivery Network (CDN)
- Which element of the AWS global infrastructure will be used in this case?

What's Your Answer: ***AWS Edge Locations***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 3

- Ellen's company is transitioning one of their legacy applications to AWS
- This application requires uptime of at least 99.5%
- They want to be sure any issues at a single data center don't cause an outage
- Which element of the AWS global infrastructure supports this need?

What's Your Answer: *AWS Availability Zones*

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

Module Wrap Up

Take a minute to write down any areas from this module that you don't fully understand or where you still have questions:

Understanding Cloud Economics

Learning Outcomes

- Know the difference between two types of expenses and how they differ between traditional/cloud infrastructure:
  - CapEx
  - OpEx
- Know the definition and use of:
  - Resource Tags
  - AWS Cost Explorer
  - AWS Migration Hub and Migration Evaluator
  - AWS Pricing Calculator *(formerly AWS Simple Monthly Calculator)*
- Be able to explain consolidated billing with AWS Organizations

Links You'll Need

- AWS Migration Hub
- AWS Pricing Calculator
- AWS Cost Explorer (in AWS Console)

Overview

When building a data center, an organization invests in upfront costs for the building, servers, and supporting equipment. This type of expense to attain a fixed asset is referred to as a ***Capitalized Expenditure*** or ***CapEx***.

The regular day to day expenses of a business are considered ***Operational Expenditure*** or ***OpEx***. After the initial build of a data center, ongoing connectivity, utility, and maintenance costs would be considered ***OpEx***.

Fill in the diagram below:

Manage Your Own Data Center	Leverage Cloud Infrastructure
Large up-front costs (CapEx)	*No up-front investment*
Potential for either under-used capacity or unmet demand	You Pay as You Go for Infrastructure (OpEx)
Increasing capacity takes time and additional investment (CapEx)	Capacity Scales to Meet User Demand and Can Be Provisioned Immediately
Monthly Costs will Map to Predicted Infrastructure Needs	*Monthly costs will map to user demand*

Organizing and Optimizing AWS Costs

AWS *Costs Explorer* is a user interface for reviewing AWS costs, forecasting future costs, and providing recommendations for cost optimization.

AWS *Migration Hub* and *Migration Evaluator* are tools for creating a case to move to the cloud.

AWS ___*Pricing Calculator*___ is a tool for estimating the cost of running specific AWS infrastructure. ***(formerly known as the AWS Simple Monthly Calculator)***

You can segment your AWS costs by adding metadata to your AWS resources. This metadata is called ___*a Resource Tag*___.

Scenarios

The following scenarios are presented in the course as a way to explore your understanding of the module. Include your answer here in this outline, as well as your notes on the solution to each scenario.

SCENARIO 1

- Oscar's company has multiple departments that work within AWS
- Finance is asking for a clean separation of AWS costs between departments
- Currently all resources are included within a single AWS account
- What approach would meet this need for future costs with minimal effort?

What's Your Answer: ___*Use Resource Tags*___

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 2

- Cindy's company is considering a transition to the cloud
- They currently have two physical data centers that they own and maintain
- Stakeholders are questioning whether this approach will save money
- Which approach should Cindy take to make a case for the cloud?

What's Your Answer: ***Utilize AWS Migration Hub or Migration Evaluator to build a business case***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 3

- William is a web developer at his company
- Given some recent downtime he is looking at moving their site to the cloud
- Finance is asking for an estimate of costs for this transition to AWS
- What approach should William take to get this data to his finance team?

What's Your Answer: ***Use the AWS Pricing Calculator***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

Module Wrap Up

Take a minute to write down any areas from this module that you don't fully understand or where you still have questions:

Supporting AWS Infrastructure

Learning Outcomes

- AWS Support Plans
  - Understand differences between plans
  - Be able to select a plan tier based on needs
- Understand use of support tools:
  - AWS Trusted Advisor
    - Know the categories of recommendations provided
  - AWS Personal Health Dashboard
- Understand resources available to assist in cloud implementation:
  - AWS Quick Starts
  - AWS Partner Network – Consulting Partners
  - AWS Professional Services

Links You'll Need

- AWS Trusted Advisor (in AWS Console)
- AWS Personal Health Dashboard (in AWS Console)
- AWS Support Plans
- AWS Quick Starts
- AWS Partner Network
- AWS Professional Services

Overview

"AWS ***Personal Health Dashboard*** provides alerts and remediation guidance when AWS is experiencing events that may impact you." - Amazon Web Services

AWS ***Trusted Advisor*** is an automated tool for checking your AWS usage against best practices.

AWS Trusted Advisor provides recommendations in the following five categories:

1. ***Cost Optimization***

2. *Performance*
3. *Security*
4. *Fault Tolerance*
5. *Service Limits*

AWS Support Plan Tiers

Communication Methods for Technical Questions

Check the cells below for which communication methods are supported with the support plan.

Support Plan	Email	Chat	Phone
Basic			
Developer	*Yes*		
Business	*Yes*	*Yes*	*Yes*
Enterprise	*Yes*	*Yes*	*Yes*

Support Response Times

Enter in the cells below the response times for each incident type based on the support plan (some cells will remain empty).

Incident Type	Developer	Business	Enterprise
General Guidance	24 Business Hours	*24 Hours*	*24 Hours*
System Impaired		12 Hours	*12 Hours*
Production System Impaired		*4 Hours*	4 Hours
Production System Down		*1 Hour*	*1 Hour*
Business Critical System Down			*15 Minutes*

When You Need Help

AWS Quick Starts provides step by step deployment instructions for common technology platforms on AWS.

AWS Partner Network ___Consulting___ Partners are third party consultants that have met the criteria to be in the AWS partner program. These people can assist with your cloud implementation.

AWS ___Professional___ ___Services___ enables you to utilize AWS employees for assistance as consultants in your cloud implementation.

Scenarios

The following scenarios are presented in the course as a way to explore your understanding of the module. Include your answer here in this outline, as well as your notes on the solution to each scenario.

SCENARIO 1

- Sylvia's company is in the process of moving multiple workloads into AWS
- One of these workloads is a mission critical application
- Her CTO says that they need to be able to call support 24 hours a day
- What is the most cost-effective support plan that meets these criteria?

What's Your Answer: ***Business Support***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 2

- Edward's company is evaluating AWS for future workloads
- One of the workloads supports multiple offices globally
- The company needs to be able to call, text, or email support if an issue occurs
- The company also needs a response from support in 15 minutes
- What is the most cost-effective support plan that meets these criteria?

What's Your Answer: ***Enterprise Support***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

SCENARIO 3

- William has an AWS account for a personal project
- He doesn't expect to need technical guidance from AWS
- He does want access to the AWS Trusted Advisor core checks
- What is the most cost-effective support plan that meets this criteria?

What's Your Answer: ***Basic Support***

Why did you pick this answer:

If you didn't get this one right, what insight did you gain from the explanation:

Module Wrap Up

Take a minute to write down any areas from this module that you don't fully understand or where you still have questions:

Next Steps

Complete all of the courses in this path to prepare for your AWS Certified Cloud Practitioner exam. In the last course of this path, we will include steps for registering, studying, and taking the exam.

Stay in Touch

If you have questions along the way, feel free to reach out to **David Tucker** on Twitter (@_davidtucker_) or through his website. Also, feel free to connect on LinkedIn.

For More Information

As a part of creating this course, the following resources from Amazon Web Services were referenced. If you want to learn more, feel free to go check out these resources directly:

- What is Cloud Computing
- Overview of Amazon Web Services (Whitepaper)
- AWS Well-Architected Framework