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# Outline Template

# **Section I**

# **Book Title –** [**Mastering AWS**]

*Understand AWS Cloud and its comprehensive offerings catalogue: from infrastructure to serverless applications.*

# **Subtitle -** [Cloud adoption using the AWS Cloud computing ecosystem]

*AWS provides Cloud-based tools (offerings, products) enabling businesses in all segments and sizes to seamlessly migrate or build their business IT operations in the Cloud. An exploratory journey throughout the AWS Cloud Computing ecosystem to understand the fundaments for Cloud adoption alternatives.*

# **Tagline -** [Explore AWS Cloud ecosystem]

*This book will help you in understanding the AWS Cloud and how to leverage its services and components to build your Cloud-based environment.*

# **Who is this book for-** [Students and Professionals]

*This book was written for the technical Cloud computing aficionado. Systems Engineers, Solutions Engineers, Solution Architects, Systems Architects, Software Engineers, and related professionals in the Information Technology industry, and for students of the same industry, whose target career is planned to include Cloud computing knowledge.*

**Book Description**

*AWS is one of the major global Cloud Services Providers, competing directly with Google, IBM, Microsoft, and Oracle, and with large providers of specialized Cloud services. When building a Cloud-based environment to replace former on-premises operations, there is a wide variety of component services and models to choose from development framework, application platform, data services, middleware, web services, and infrastructure, among many others. AWS provides the full stack to enable businesses to adopt the Cloud, including different components with the same purpose, while depending on connectors and interfaces. This book will explore it all, providing a complete reference to adopting the Cloud with AWS.*

*The book is presented as an exploratory journey, navigating through the diverse AWS ecosystem, while putting the pieces together to implement the four main Cloud models.*

*After reading this book, the student or professional will be able to participate in Cloud adoption projects, with a solid reference source to be an active participant in the project team.*

# **Key Features**

*By reading this book you will learn about the AWS Cloud and its components, and where to use them in a Cloud-related project.*

*To participate in a Cloud-related project, it is important to know the objectives of the system to be built, as much as to know the functionality, purpose, pros, and cons when using one component versus the other.*

*The book was written with a technical perspective, including logical design, diagrams, and architecture representations of the AWS components. It is a step-by-step exploration until the reader understands those components and what the alternatives to put them together are.*

# **Competitor Analysis**

*Please list the top two competing books*

[Insert Text Here]

[Insert Text Here]

TBD – while I browsed through the many books on the topic, I learned there are more that might be relevant and/or important to compare. However, none so far have an end-to-end AWS overview and use cases like we plan to do. I will have these titles the sooner I can (also, if the team has recommendations, they are welcome).

**Tech List –** [AWS Cloud Products]

*This book will reference to all AWS Cloud Product Categories: Analytics; Application Integration; Blockchain; Business Applications; Cloud Financial Management; Compute; Containers; Database; Developer Tools; End User Computing; Front-End Web & Mobile.*

*Internet of Things; Machine Learning; Management & Governance; Media Services; Migration & Transfer; Networking & Content Delivery; Quantum Technologies; Robotics; Satellite; Security, Identity, & Compliance, and Storage.*

# **Author Bio -** [Paulo H. Leocadio]

Paulo Leocadio developed the bulk of his professional career working for Microsoft Corp., where he held Leadership and Consultant positions with Microsoft Services Division. As Director of Support Engineering, he led a multi-country organization with over 200 professionals delivering services to approximately nine thousand customers across Latin America, with a P&L of $48MM. Earlier he led the Enterprise (Premier) Support business overseeing 7 services practices, managing direct relationship with top 550 tiered customers in 28 Latin America countries, having grown the business from $12MM to $67MM in revenue and meeting a 42% delivery margin during his five years tenure. Earlier in his career, Paulo gained extensive experience in designing and delivering solutions for large corporations and governments in different countries, managing complex projects and solving business problems with technology and applied sciences.

Paulo holds an Electronics Engineering degree from Universidade Mackenzie (Brazil), and an M. B. A. in International Business, with distinction, from Strayer University. He has completed additional studies at Northwestern’s University Kellogg College (Marketing Excellence), UC San Diego (Data Sciences), and Phoenix University (Doctorate in Information Systems and Technologies, incomplete). He has lectured on new and emerging technologies and software engineering methodologies on symposiums and expositions worldwide.

Paulo has participated in several USTDA-sponsored technical assistances over the last five years such as Cloud and Big Data Smart City for the Government of the Municipality of Istanbul (Solutions Architect); Ho Chi Minh City Intelligent Operations Centre Project (Cloud Solutions Architect), and Philippines DICT Cloud Centre of Excellence (Solutions Architect). He is actively participating in different phases of on-going bids and contract processes.

Paulo’s in-depth expertise are concentrated in Cloud, Data Sciences, Digital Transformation, Smart Cities, IT Operations Management.

# **Section II**

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| *IaaS* | *2.* | *Compute* | *40* |  |
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| *IaaS* | *5.* | *Security, Identity and Compliance* | *50* |  |
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|  | *13.* | *AWS Well-Architected Framework* | *75* |  |

**Chapter Details**

**Chapter 1: [Introduction] [22 pages]**

**Description**:AWS architecture

**Topics to be covered:** Immersion on AWS architecture showing components and respective services.

**Chapter 2: [Compute] [40 pages]**

**Description**:AWS Compute is a set of physical servers that power an operating system (OS) through provided memory, processing, and storage infrastructure.

**Topics to be covered:**

* Compute
  + Amazon EC2
  + Amazon EC2 Auto Scaling
  + Amazon EC2 Spot Instances
  + Amazon Elastic Container Service (ECS)
  + Amazon Elastic Kubernetes Service (EKS)
  + Amazon Lightsail
  + AWS App Runner
  + AWS Auto Scaling
  + AWS Batch
  + AWS Compute Optimizer
  + AWS Elastic Beanstalk
  + AWS Fargate
  + AWS Lambda
  + AWS Local Zones
  + AWS Outposts
  + AWS Serverless Application Repository
  + AWS SimSpace Weaver
  + AWS Wavelength
  + VMware Cloud on AWS

**Chapter 3: [Storage] [40 pages]**

**Description**: AWS storage services are grouped by three different sub-categories: block storage, file storage, and object storage. This chapter details file and storage types.

**Topics to be covered:**

* Storage
  + Amazon Elastic Block Store (EBS)
  + Amazon Elastic File System (EFS)
  + Amazon FSx
  + Amazon S3 Glacier
  + Amazon Simple Storage Service (S3)
  + AWS Backup
  + AWS Snow Family
  + AWS Storage Gateway
  + AWS Elastic Disaster Recovery (DRS)

**Chapter 4: [Content Delivery Network] [35 pages]**

**Description**: A content delivery network (CDN) can deliver two types of content: static content and dynamic content. CDNs work by establishing a point of presence (POP) or a group of CDN edge servers at multiple geographical locations. This geographically distributed network works on the principles of caching, dynamic acceleration, and edge logic computations.

AWS IoT provides the cloud services that connect your IoT devices to other devices and AWS cloud services. AWS IoT provides device software that can help integrate IoT devices into AWS IoT-based solutions. If the existing devices can connect to AWS IoT, AWS IoT can connect them to the cloud services that AWS provides.

AWS Satellite category contains a fully managed service that enables the control of satellite communications, downlink and process satellite data, and scale satellite operations without having to build or manage and own a ground station infrastructure. Satellites are used for a wide variety of use cases, including weather forecasting, surface imaging, communications, and video broadcasts. Ground stations are at the core of global satellite networks, which are facilities that provide communications between the ground and the satellites by using antennas to receive data and control systems to send radio signals to command and control the satellite. Today, operators must either build their own ground stations and antennas, or obtain long-term leases with ground station providers, often in multiple countries to provide enough opportunities to contact the satellites as they orbit the globe. Once all this data is downloaded, servers, storage, and networking are needed near the antennas to process, store, and transport the data from the satellites.

**Topics to be covered:**

* Networking and Content Delivery
  + Amazon VPC
  + AWS App Mesh
  + AWS Cloud Map
  + AWS Direct Connect
  + AWS Global Accelerator
  + AWS Private 5G
  + AWS PrivateLink
  + AWS Transit Gateway
  + AWS Verified Access
  + AWS VPN
  + Elastic Load Balancing (ELB)
* Internet of Things
  + AWS IoT Core
  + AWS IoT FleetWise
  + AWS IoT SiteWise
  + AWS IoT TwinMaker
  + AWS IoT Greengrass
  + AWS IoT 1-Click
  + AWS IoT Analytics
  + AWS IoT Button
  + AWS IoT Device Defender
  + AWS IoT Device Management
  + AWS IoT EduKit
  + AWS IoT Events
  + AWS IoT RoboRunner
  + AWS Partner Device Catalog
  + FreeRTOS
* Satellite
  + AWS Ground Station

**Chapter 5: [Security, Identity & Compliance] [50 pages]**

**Description**:AWS and its partners offer a wide range of tools and features to help customers meet their security objectives and adhere to compliance policies. These tools mirror the controls currently deployed within on-premises environments. AWS provides security-specific tools and features across network security, configuration management, access control and data security. In addition, AWS provides monitoring and logging tools that provide full visibility into what is happening in your environment.

**Topics to be covered:**

1. Amazon Cognito
2. Identity management for your apps
3. Amazon Detective
4. Amazon GuardDuty
5. Amazon Inspector
6. Amazon Macie
7. Amazon Security Lake
8. Amazon Verified Permissions
9. AWS Artifact
10. AWS Audit Manager
11. AWS Certificate Manager
12. AWS CloudHSM
13. AWS Directory Service
14. AWS Firewall Manager
15. AWS IAM Identity Center
16. AWS Identity and Access Management
17. AWS Key Management Service (KMS)
18. AWS Network Firewall
19. AWS Resource Access Manager
20. AWS Secrets Manager
21. AWS Security Hub
22. AWS Shield
23. AWS WAF

**Chapter 6: [Database] [50 pages]**

**Description**:A database is an electronically stored, systematic collection of data. It can contain any type of data, including words, numbers, images, videos, and files. You can use software called a database management system (DBMS) to store, retrieve, and edit data. In computer systems, the word database can also refer to any DBMS, to the database system, or to an application associated with the database.

A cloud database typically runs on a cloud-computing platform. There are two standard deployment models: users can run databases on the cloud independently or purchase access from a cloud database provider. Cloud databases can follow both SQL and NoSQL data models.

AWS Cloud Databases provides a broad selection of purpose-built databases for any enterprise. AWS databases support all database management tasks, such as server provisioning, patching, configuration, and backups. As a result, you can focus on application development while AWS continuously monitors databases and automate scaling.

**Topics to be covered:**

* Database
  + Amazon Aurora
  + Amazon DocumentDB
  + Amazon DynamoDB
  + Managed NoSQL database
  + Amazon ElastiCache
  + Amazon Keyspaces (for Apache Cassandra)
  + Amazon MemoryDB for Redis
  + Amazon Neptune
  + Amazon RDS
  + Amazon Redshift
  + Amazon Timestream

**Chapter 7: [Developer Tools & DevOps (IaC)] [55 pages]**

**Description**: Developer Tools provide services to code, build, test, and deploy applications. The user can leverage core tools like software development kits (SDKs), code editors, and continuous integration and delivery (CI/CD) services for DevOps software development. Use machine learning (ML) -guided best practices and abstractions to improve agility, security, velocity, and code quality.

Application integration on AWS is a suite of services that enable communication between decoupled components within microservices, distributed systems, and serverless applications. These services provide decoupling for microservices, distributed systems, and serverless applications, allowing developers to connect apps, without needing to write custom code to enable interoperability.

Containers are a key component of modern app development. They have become the standard way to organize compute resources and manage the content of application deployments.

A container is a standardized unit of software development that holds everything that a software application requires to run. This includes relevant code, runtime, system tools, and system libraries. Containers are created from a read-only template that's called an image. Images are typically built from a Dockerfile. A Dockerfile is a plaintext file that specifies all the components that are included in the container. After they're built, these images are stored in a registry such as Amazon ECR where they can be downloaded from.

Containers provide a discrete reproducible compute environment. They also provide a way to simplify packaging and dependency management. From the orchestration of very large multi-cluster estates to web applications - or even and doing a proof of concept on the developer computer - they are a great way to get started and build software to deploy in the cloud.

With the assumption that robots are machines that sense, compute, and act.AWS Robotics provide a robotics development environment for application development, a robotics simulation service to accelerate application testing, and a robotics fleet management service for remote application deployment, update, and management.

AWS Quantum Technologies provide a fully managed quantum computing service that helps researchers and developers get started with the technology to accelerate research and discovery. Thes technologies provide a development environment for developers to explore and build quantum algorithms, test them on quantum circuit simulators, and run them on different quantum hardware technologies.

**Topics to be covered:**

* Developer Tools
  + Amazon CodeCatalyst
  + Amazon CodeGuru
  + Amazon Corretto
  + AWS Cloud Control API
  + AWS Cloud Development Kit (CDK)
  + AWS Cloud9
  + AWS CloudShell
  + AWS CodeArtifact
  + AWS CodeBuild
  + AWS CodeCommit
  + AWS CodeDeploy
  + AWS CodePipeline
  + AWS CodeStar
  + AWS Command Line Interface (CLI)
  + AWS Device Farm
  + AWS Fault Injection Simulator
  + AWS Tools and SDKs
  + AWS X-Ray
  + Amazon CodeWhisperer
* Application Integration
  + Application Integration
  + Amazon AppFlow
  + Amazon EventBridge
  + Amazon Managed Workflows for Apache Airflow (MWAA)
  + Amazon MQ
  + Amazon Simple Notification Service (SNS)
  + Amazon Simple Queue Service (SQS)
  + Managed message queues
  + Application Integration
  + AWS Step Functions
* Containers
  + Amazon Elastic Container Registry (ECR)
  + Amazon Elastic Container Service (ECS)
  + Amazon Elastic Kubernetes Service (EKS)
  + AWS App2Container
  + AWS Copilot
  + AWS Fargate
  + Red Hat OpenShift Service on AWS
  + Managed OpenShift in the cloud
* Robotics
  + AWS RoboMaker
* Quantum Technologies
* Amazon Braket

**Chapter 8: [End User Computing, Front End & Mobile] [27 pages]**

**Description**:AWS offers a broad set of tools and services to support development workflows for native iOS/Android, React Native, and JavaScript developers.

The purpose-built tools and services for front-end web and mobile developers through AWS, makes it easier to build apps with cloud functionality on AWS, enabling a faster go-to-market outcome.

These services provide an end-to-end solution to develop, deliver, test, and monitor anr app. Customers can combine front-end tools with the breadth and depth of AWS services to support evolving business requirements.

The Front-end web and mobile tools and services are built on top of AWS, so developers benefit from the reliability of AWS infrastructure to on the delivery of secure, highly available apps that can scale automatically across the globe.

**Topics to be covered:**

* End User Computing
  + Amazon AppStream 2.0
  + Amazon WorkSpaces Family
* Front-end Web & Mobile
  + Amazon API Gateway
  + Amazon Location Service
  + Amazon Pinpoint
  + Amazon Simple Email Service (SES)
  + AWS Amplify
  + AWS AppSync
  + AWS Device Farm

**Chapter 9: [Applications for Business] [75 pages]**

**Description**:AWS innovative business applications with the same on-demand scalability, reliability, pay-as-you go pricing, and machine learning that drives AWS cloud infrastructure. This category of services quickly procures and deploy business application software that address your need to enhance business agility, lower costs, and transform the customer experience. Also, customers centralize governance, innovate quickly, and launch business application products that align with your organization’s policies and compliance requirements. A customer can access pricing options that give you the flexibility to test business application platforms, pay as you go, negotiate custom terms, and save money with long-term commitments.

AWS Cloud Financial Management services enable the customer to transform their business with cost transparency, control, forecasting, and optimization systems and solutions. The cloud allows customers to trade fixed expenses (such as data centers and physical servers) for variable expenses, and only pay for IT as you consume it. And, because of the economies of scale, the variable expenses are much lower than what you would pay to do it yourself. Whether the customer was born in the cloud or are just starting their migration journey to the cloud, AWS has a set of solutions to help on the management and optimization of their spend.

AWS offers a purpose-built media service, software, and to make creating, transforming, and delivering digital content fast and easy. With pay-as-you-go Media Services and advanced video processing appliances, customers can produce creative projects and innovative viewing experiences.

Amazon Managed Blockchain (AMB) is a fully managed service designed to help customers to build resilient Web3 applications on both public and private blockchains. AMB provides tools for instant and serverless access to multiple blockchains. Customers can Web3-ready applications without having to worry about deploying specialized blockchain infrastructure and keeping them connected to the blockchain network. Also, AMB offers a developer-friendly APIs to access real-time and historical data from multiple blockchains. The standardized blockchain data can be integrated with AWS services, with no specialized blockchain infrastructure or ETL (extract, transform, and load) needed. All AMB features scale securely for institutional grade and mainstream consumer application builds.

**Topics to be covered:**

* Business Applications
  + Alexa for Business
  + Amazon Chime
  + Amazon Chime SDK
  + Amazon Connect
  + Amazon Honeycode
  + Amazon Pinpoint
  + Amazon Simple Email Service (SES)
  + Amazon WorkDocs
  + Amazon WorkMail
  + AWS Supply Chain (Preview)
  + AWS Wickr
* Cloud Financial Management
  + Amazon EC2 Spot Instances
  + AWS Budgets
  + AWS Cost and Usage Report
  + AWS Cost Explorer
  + Reserved Instance (RI) Reporting
  + Savings Plans
* Media Services
  + Amazon Elastic Transcoder
  + Amazon Interactive Video Service
  + Amazon Kinesis Video Streams
  + Amazon Nimble Studio
  + AWS Elemental Appliances & Software
  + AWS Elemental MediaConnect
  + AWS Elemental MediaConvert
  + AWS Elemental MediaLive
  + AWS Elemental MediaPackage
  + AWS Elemental MediaStore
  + AWS Elemental MediaTailor
* Blockchain
  + Amazon Managed Blockchain
  + Amazon Quantum Ledger Database (QLDB)

**Chapter 10: [Analytics and Machine Learning] [19 pages]**

**Description**:AWS provides a broad selection of analytics services that fit all data analytics needs and enables organizations of all sizes and industries to reinvent their business with data. From data movement, data storage, data lakes, big data analytics, log analytics, streaming analytics, business intelligence, and machine learning (ML) to anything in between, AWS offers purpose-built services built to provide the best price-performance, scalability, and lowest cost.

AWS provides machine learning services to help professionals build smarter applications and processes and make better decisions from the available data. Amazon have been investing in artificial intelligence for more than twenty years. Machine learning is at the core of what our customers experience—from providing you with product recommendations on Amazon.com to Echo powered by Amazon Alexa. Amazon’s mission is to share their experience and machine learning capabilities for all organizations to benefit from AI.

**Topics to be covered:**

* Analytics
  + Amazon Athena
  + Amazon CloudSearch
  + Amazon DataZone (Preview)
  + Amazon EMR
  + Hosted Hadoop framework
  + Amazon FinSpace
  + Amazon Kinesis
  + Amazon Managed Streaming for Apache Kafka (MSK)
  + Amazon OpenSearch Service
  + Amazon QuickSight
  + Amazon Redshift
  + AWS Clean Rooms (Preview)
  + AWS Data Exchange
  + AWS Data Pipeline
  + AWS Glue
  + AWS Lake Formation
* Machine Learning
  + Amazon Augmented AI
  + Amazon Bedrock
  + Amazon CodeGuru
  + Amazon Comprehend
  + Amazon DevOps Guru
  + Amazon Elastic Inference
  + Deep learning inference acceleration
  + Amazon Forecast
  + Amazon Fraud Detector
  + Amazon HealthLake
  + Amazon Kendra
  + Amazon Lex
  + Amazon Lookout for Equipment
  + Amazon Lookout for Metrics
  + Amazon Monitron
  + Amazon Omics
  + Amazon Personalize
  + Amazon Polly
  + Amazon Rekognition
  + Amazon SageMaker
  + Amazon SageMaker Ground Truth
  + Amazon Textract
  + Amazon Transcribe
  + Amazon Translate
  + Apache MXNet on AWS
  + AWS Deep Learning AMIs
  + AWS Deep Learning Containers
  + AWS DeepComposer
  + AWS DeepLens
  + AWS DeepRacer
  + AWS Inferentia
  + AWS Panorama
  + PyTorch on AWS
  + TensorFlow on AWS
  + Amazon CodeWhisperer

**Chapter 11: [Management & Governance] [50 pages]**

**Description** AWS Management and Governance Services are a suite of tools designed to help the management of existing AWS resources in a secure, scalable, and cost-effective manner. Customers can use AWS Management and Governance services to assess their resource utilization and identify ways to reduce costs.

**Topics to be covered:**

* Amazon CloudWatch
* Amazon Managed Grafana
* Amazon Managed Service for Prometheus
* AWS Chatbot
* ChatOps for AWS
* AWS CloudFormation
* AWS CloudTrail
* AWS Command Line Interface (CLI)
* AWS Compute Optimizer
* AWS Config
* AWS Control Tower
* AWS Distro for OpenTelemetry
* AWS Launch Wizard
* Easily size, configure, and deploy third party applications on
* AWS License Manager
* AWS Managed Services
* AWS Management Console Mobile Application
* AWS OpsWorks
* AWS Organizations
* AWS Personal Health Dashboard
* AWS Proton
* AWS Resilience Hub
* AWS Service Catalog
* AWS Service Management Connector
* AWS Systems Manager
* AWS Trusted Advisor
* AWS Well-Architected Tool

**Chapter 12: [Migration & Transfer] [22 pages]**

**Description**:AWS provides services that enable customers migrate any workload – applications, websites, databases, storage, physical or virtual servers – and even entire data centres from an on-premises environment, hosting facility, or other public cloud to AWS.

**Topics to be covered:**

1. AWS Application Migration Service (MGN)
2. AWS Application Discovery Service
3. AWS Database Migration Service (DMS)
4. AWS DataSync
5. AWS Mainframe Modernization
6. AWS Migration Hub
7. AWS Transfer Family
8. Migration Evaluator (formerly TSO Logic)

**Chapter 13: [AWS Well-Architected Framework] [35 pages]**

**Description**: **“**AWS Well-Architected helps cloud architects build secure, high-performing, resilient, and efficient infrastructure for a variety of applications and workloads. Built around six pillars—operational excellence, security, reliability, performance efficiency, cost optimization, and sustainability—AWS Well-Architected provides a consistent approach for customers and partners to evaluate architectures and implement scalable designs. “

**Topics to be covered:**

* AWS Well-Architected and the Six Pillars.
* AWS Well-Architected Lenses
* AWS Well-Architected Guidance
* AWS Architecture Center
* AWS Architect Learning Path