

IBM Cloud Advocate Study Guide



This study guide will help prepare you for the IBM Cloud Advocate Certification Examination.

What's in the Study Guide

This study guide covers:

- ❑ ***Introduction to Cloud Computing***



How to Use this Study Guide



Read the content.



Take notes.



**Answer practice
questions.**

Preparation

Thorough study is essential to a successful outcome on the exam.



- Clear your schedule.
- Find a quiet place to study.
- Focus on the content.



- Open the associated on-line course for reference.
- Locate the study guide.
- Download the study guide.



- Print a copy of the study guide.
- Take notes.

Courses and Objectives

Courses

1. The Cloud and Why People Use It
2. The History and Evolution of the Cloud
3. Cloud Adoption and Migration
4. Job Roles that Support Cloud

Objectives

- Define the cloud and why people use it
- Identify benefits and characteristics of cloud computing
- Summarize the history and evolution of the cloud
- Define cloud adoption and migration
- Identify the strategies needed to develop a successful migration plan
- Gain awareness of various job roles users of IBM Cloud have



Course 1.1: The Cloud and Why People Use It

Introduction and Objectives:

In Course 1.1 of the study guide, the subject matter:

- Focuses on the definition of cloud computing.
- Emphasizes key characteristics of cloud computing.
- Provides information on the benefits of cloud computing.

Lessons

- Introduction and Objectives
- The Cloud
- Characteristics and Benefits of Cloud Computing
- Course Summary
- Knowledge Check Questions

Objectives

- Define the cloud and why people use it
- Identify the benefits and characteristics of cloud computing

Course 1.1: The Cloud and Why People Use It

Definition of Cloud Computing

The US National Institute of Standards and Technology (NIST) defines cloud computing as a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. Examples of computing resources include networks, servers, storage, applications, and services.

Five Essential Characteristics of the Cloud

On-demand self-service

- Processing power, storage, and network via simple interface without any human interaction.

Broad network access

- Via the network through standard mechanisms and platforms such as mobile phones, tablets, laptops, and workstations.

Resource pooling

- Uses a multitenant model – resources are dynamically assigned and reassigned according to demand without customer concern regarding the resource’s physical location.

Rapid elasticity

- Access more resources when you need them or scale back when you do not.

Measured service

- Only pay for what you use or reserve.

Types of Cloud Deployment Models

Public

Owned by cloud provider but usage is shared with other organizations

Private

Exclusive use by a single organization

Hybrid

Uses on-premises private cloud and a third-party public cloud

Multi-cloud

Blends different clouds of the same type

Course 1.1: The Cloud and Why People Use It

Benefits of Cloud Computing

Cost

- Allows users to purchase capacity and services as they are being used. Uses remote resources that are shared with others to save on the cost of servers, equipment, and IT.

Flexible

- Provides on-demand scaling based on the needs of each workload. Users have a selection of prebuilt tools and features that fits their specific needs.

Efficient

- Cloud apps and data are accessible from any device with an internet connection. Frequent technology updates get products quickly to market.

Secure

- Virtual private cloud, encryption, and APIs help secure data. There are redundant backups, and disaster recovery is generally inexpensive.

1.1: The Cloud & Why People Use It

Check Your Knowledge



Question 1

According to NIST, what is cloud computing?

- A. A marketing term invented by Amazon Web Services (AWS)
- B. Salesforce applications hosted in a remoted data center
- C. On-demand network access to shared resources
- D. A hardware server divided into multiple virtual servers

➔ **Answer C.** Cloud computing is an on-demand network access to shared resources.

1.1: The Cloud & Why People Use It

Check Your Knowledge



Question 2

What are on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured services are considered which of the following?

- A. Characteristics of a service provider according to IBV
- B. Characteristics of compute options according to Gartner
- C. Characteristics of deployment models according to ITG
- D. Characteristics of the cloud computing according to NIST

➔ **Answer D.** According to NIST, on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured services are considered the five essential characteristics of the cloud.

1.1: The Cloud & Why People Use It

Check Your Knowledge



Question 3

Lower IT costs, flexible, efficient, secure, and faster time to market are all benefits of _____.

- A. Cluster computing
- B. Personal computing
- C. Time sharing computing
- D. Cloud computing

➔ **Answer D.** Benefits of cloud computing include cost savings, flexible, efficient (faster time to market), and secure.

1.1: The Cloud & Why People Use It

Check Your Knowledge



Question 4

Users can take advantage of cloud computing by using the _____ that the cloud provides to react more quickly to changing business needs.

- A. Monitoring
- B. Artificial Intelligence
- C. Agility
- D. Security

➔ **Answer C.** Cloud Computing offers improved agility, resulting in a faster time to market.

1.1: The Cloud & Why People Use It

Check Your Knowledge



Question 5

Cloud providers have redundancy built into their _____, data _____, and disaster _____.

- A. Systems, storage, recovery
- B. Networks, backup, recovery
- C. Networks, storage, recuperation
- D. Cloud, backup, recovery

➔ **Answer B.** Cloud providers have redundancy built into their networks, data backup, and disaster recovery.

1.1: The Cloud & Why People Use It

Check Your Knowledge



Question 6

Which of the following are considered three types of cloud deployment models?

- A. Public, Private, Hybrid
- B. Network, Public, Private
- C. Public, Server, Private
- D. Public, Private, Application

➔ **Answer A.** Three types of cloud deployment models include Public, Private, and Hybrid.



Course 1.2: The History & Evolution of IBM Cloud

Introduction and Objectives:

In Course 1.2 of the study guide, the subject matter:

- Highlights the history and evolution of cloud computing.
- Provides information on virtualization, containers, and serverless computing.

Lessons

- Introduction and Objectives
- History of the Cloud
- Virtualization and Containers
- Serverless
- Course Summary
- Knowledge Check Questions

Objectives

- Summarize the history and evolution of the IBM Cloud
- Describe virtualization, containers, and serverless computing



Course 1.2: The History & Evolution of IBM Cloud

Cloud computing is an evolution of technology over time.

1950s	<ul style="list-style-type: none">• Concept of cloud computing evolves.• The practice of time sharing or resource pooling evolved to make more efficient use of computing power via the mainframe.• Shared access to the mainframe is limited by geographical constraints.
1960s	<ul style="list-style-type: none">• In 1966, the ARPANET (Advanced Research Projects Agency Network) project is initiated to enable access to remote computers.• IBM invents virtualization in 1967, which allows multiple virtual machines to run on a single physical host.
1970s	<ul style="list-style-type: none">• The release of an operating system called Virtual Machine (VM) made it possible for mainframes to have multiple virtual systems or VMs on a single physical node.• Virtualization became a technology driver and a huge catalyst for the largest evolutions in communications and computing.
1980s	<ul style="list-style-type: none">• IBM invents the PC allowing more and more households and companies to own computers.• Wired Ethernet networks allow companies to connect their computers.
1990s	<ul style="list-style-type: none">• Over 1 million computers are connected to the Internet by 1992.• E-commerce starts to Emerge – Amazon is founded in 1995.• Compaq coins the term "Cloud Computing" in 1995.
2000s	<ul style="list-style-type: none">• Off-site, centrally managed hosting in data centers become more prevalent.• Server virtualization becomes the norm, with VMware as a dominant player.• In 2006, Amazon launches its Elastic Compute Cloud.• Both IBM and Microsoft have entered the cloud computing market by the end of the 2000s.
2010s	<ul style="list-style-type: none">• Office 365 is launched in 2011, bringing SaaS to the masses.• Docker is established in 2013 and Kubernetes in 2014, paving the way for container-based solutions.• Serverless computing on the cloud is established in 2014.• Technologies such as the Internet of Things, Blockchain, and IBM Watson become established.• Edge Computing, Fog Computing, and advances in Machine Learning as well as quantum computing are among likely future developments.



Course 1.2: The History & Evolution of IBM Cloud

What is virtualization?

Virtualization is the foundation of cloud computing, allowing multiple virtual machines to run on a single physical host.

Types of Virtualization

Desktop	Network	Application	Server
<p>Runs multiple operating systems on the same computer in their own VM.</p>	<p>Uses software to create an overview of the network that an admin can use to manage without needed access to the physical components.</p>	<p>Runs application software without needing it to be installed in the OS.</p>	<p>Allows multiple 'guest' servers to share the same physical hardware by installing a hypervisor.</p>
<p>2 types:</p> <ul style="list-style-type: none">• Virtual desktop• Local desktop	<p>2 types:</p> <ul style="list-style-type: none">• Software-defined networking (SDN)• Network function virtualization (NFV)	<p>3 types:</p> <ul style="list-style-type: none">• Local application• Application streaming• Server-based application	

Benefits of Virtualization

- Resource efficiency
- Easier management
- Minimal downtime
- Faster provisioning



Course 1.2: The History & Evolution of IBM Cloud

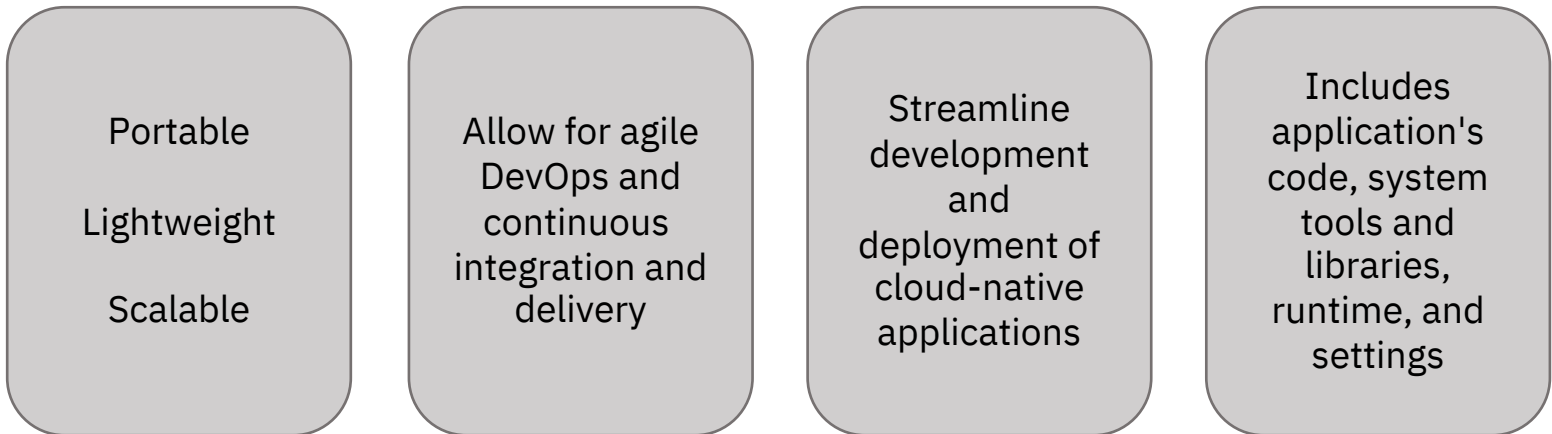
What are containers?

Containers are an executable unit of software in which application code is packaged, along with its libraries and dependencies, in common ways so that it can be run anywhere, whether it be on desktop, traditional IT, or the cloud.

Container Characteristics

Containers are small, fast, and portable, and unlike VMs, they do not need to include a guest OS in every instance. They can instead simply leverage the features and resources of the host OS.

Benefits of Containers



What is serverless computing?

Serverless is a cloud execution model that offloads management responsibility, such as patching, provisioning, scheduling, and scaling to cloud providers while developers can spend their time and effort on coding or building their applications.

Despite what the name implies, serverless environments are still built on a server infrastructure; however, they are invisible in the sense that the clients do not see, manage, or interact with the servers.

1.2: The History & Evolution of IBM Cloud Check Your Knowledge



Question 1

How does virtualization assist with cloud computing?

- A. Speeds up mathematical calculations
- B. Facilitates the management of keys
- C. Slower provisioning
- D. Efficient use of physical computer hardware

➔ **Answer D.** Virtualization assists with cloud computing by efficiently using physical computer hardware.

1.2: The History & Evolution of IBM Cloud Check Your Knowledge



Question 2

Which company is responsible for introducing virtualization?

- A. IBM
- B. Microsoft
- C. Compaq
- D. Amazon

➔ **Answer A.** IBM introduced virtualization in 1967.

1.2: The History & Evolution of IBM Cloud Check Your Knowledge



Question 3

What are resource efficiency, easier management, minimal downtime, and faster provisioning the benefits of?

- A. Visualization
- B. Resource management
- C. Virtualization
- D. Dematerialization

➔ **Answer C.** These are all benefits of virtualization.

1.2: The History & Evolution of IBM Cloud Check Your Knowledge



Question 4

What is a type of application virtualization?

- A. Virtual desktop
- B. Software-defined networking (SDN) virtualization
- C. CPU virtualization
- D. Local application virtualization

➔ **Answer D.** Local application virtualization is a type of application virtualization, along with application streaming and server-based application virtualization.



Course 1.3: Cloud Adoption & Migration

Introduction and Objectives:

In Course 3 of the study guide, the subject matter:

- Explores the reasons organizations are moving some or all of their workloads to the cloud.
- Provides information on what cloud migration entails.
- Highlights the benefits of developing a cloud migration plan.
- Focuses on how to manage a successful migration.

Lessons

- Introduction and Objectives
- Cloud Adoption and Migration
- Course Summary
- Check Your Knowledge

Objectives

- Define adoption and migration
- Explore the strategies needed to develop a successful migration plan



Course 1.3: Cloud Adoption & Migration

Cloud adoption is a strategy used by organizations to improve customer service and reduce costs while increasing efficiencies. By migrating workloads to a cloud, organizations can improve operational performance and agility, workload flexibility and scalability, and security.

Key Drivers Related to Cloud Migration

1. Agility
2. Flexibility
3. Competitiveness

Benefits of Cloud Adoption

1. Scalability – Investments in data center infrastructure and servers can be minimized by using the cloud to maximize scalability.
2. Cost-Effectiveness – Customers pay only for the capacity needed now and can scale on demand.
3. Security – Complies with applicable industry standards and government regulations.
4. Backup and Recovery – Offers simple, yet effective solutions to protect data migrated to the cloud.
5. Accelerated Adoption – Allows customers to adopt new technologies faster, while also enabling affordable, just-in-time technology adoption in response to business opportunities.
6. Cloud Dashboards – Offers real-time statistics and analytics, improving efficiencies of cloud strategies.

Challenges and Perceived Risks of Cloud Computing

- Data security
- Governance and sovereignty issues
- Legal, regulatory, and compliance issues
- Lack of standardization
- Choosing the right deployment and service models
- Partnering with the right cloud service providers
- Business continuity and disaster recovery



Course 1.3: Cloud Adoption & Migration

Key Considerations for Organizations Developing Their Cloud Strategy

1. Infrastructure and workloads – cost of building and operating data centers.
2. Software-as-a-Service (SaaS) and development platforms – paying for application access is more viable versus buying off-the-shelf software and required upgrades.
3. Speed and productivity – getting a new application up and running in a few hours in the cloud versus several weeks/months.
4. Use of cloud dashboards – efficiencies gained from cloud dashboards offers real-time statistics and active analytics.
5. Risk exposure – invest in hardware/software versus renting by the hour; work on a plan to build, write, test, and release the code if uncertain about adoption; or pay-as-you-go option versus little or no trial or adoption.

Cloud adoption is no longer an option for the future.

Today anyone can access the computing capacity needed via the cloud. An **IBM Institute for Business Value** study indicated more than three-quarters of enterprises today are using cloud computing to expand into new industries:

A value of cloud adoption is the collaboration it allows between teams across widespread geographical regions, including international locations.

To remain competitive, businesses need to be able to respond quickly to marketplace changes, use analytics to understand customer experience, and apply that understanding to adapt their products and services based on what they learn.

1.3: Cloud Adoption & Migration

Check Your Knowledge



Question 1

When thinking about migrating workloads to IBM Cloud, what is a common key driver?

- A. Agility
- B. DevOps
- C. Latency
- D. Security

➔ **Answer A.** Agility is a key driver when thinking about migrating to IBM Cloud.

1.3: Cloud Adoption & Migration Check Your Knowledge



Question 2

What is a primary benefit for companies who are considering adopting a cloud computing model?

- A. Latency
- B. Efficiency
- C. Integration
- D. Stability

➔ **Answer B.** Efficiency is a primary benefit for companies who are considering adopting a cloud computing model.

1.3: Cloud Adoption & Migration

Check Your Knowledge



Question 3

When considering risk, what should banks keep in mind when adopting a cloud computing strategy?

- A. Market trends
- B. Competitors
- C. Integration
- D. Regulatory and compliance standards

➔ **Answer D.** Banks need to be keeping regulatory and compliance standards in mind when adopting a cloud computing strategy.

1.3: Cloud Adoption & Migration

Check Your Knowledge



Question 4

According to IBM Institute of Business Value, which of the following is a reason companies often migrate to cloud computing when they consider expanding into new industries?

- A. Be seen as innovative
- B. Protection against security threats
- C. Improve the customer experience
- D. Need to modernize infrastructure

➔ **Answer C.** According to a study by the IBM Institute of Business Value, companies want to improve the customer experience when considering expanding into new industries.

1.3: Cloud Adoption & Migration Check Your Knowledge



Question 5

What process is recommended for consideration if an international company wants to adopt a cloud computing model?

- A. Relocate some of the organization's data, applications, and workloads to a cloud infrastructure.
- B. Translate the organization's data, applications, and workloads into the local languages.
- C. Redistribute the organization's data, applications, and workloads to the various countries.
- D. Choose local cloud providers in each country and move their data.

➔ **Answer A.** International companies planning to adopt a cloud computing model should consider relocating some of the organization's data, applications, and workloads to the cloud infrastructure.

1.3: Cloud Adoption & Migration

Check Your Knowledge



Question 6

What are considered benefits of cloud adoption?

- A. Infrastructure security
- B. Fixed costs and DevOps
- C. Scalability and cost-effectiveness
- D. Outsourcing and integration

➔ **Answer C.** Scalability and cost-effectiveness are considered benefits of cloud adoption.

1.3: Cloud Adoption & Migration Check Your Knowledge



Question 7

Which of the following is considered a value provided by adopting a cloud computing model?

- A. Collaboration between teams from international locations
- B. Elimination of the IT department
- C. Elimination of jobs due to automation
- D. Independence from local regulatory laws



Answer A. A cloud computing model encourages collaboration between teams from international locations.



Course 1.4: Job Roles that Support Cloud

Introduction and Objectives:

In Course 1.4 of the study guide, the subject matter:

- Focuses on the various career paths and job roles that interact with the IBM Cloud environment.
- Provides information on the different skills necessary for the job roles.
- Highlights a typical day for various jobs users of IBM Cloud have.

Lessons

- Introduction and Objectives
- Job Roles that Support Cloud
- Course Summary
- Check Your Knowledge

Objectives

- Gain awareness of different job roles users of IBM Cloud have
- Identify various career paths that interact with the IBM Cloud environment



Course 1.4: Job Roles that Support Cloud

Various Job Roles that Interact with IBM Cloud:

IBM Cloud Architect

- Designs cloud solutions to solve client problems
- Focuses on data management, which includes designing, creating, deploying, and managing an organization's data architecture

IBM Cloud Developer

- Takes a conceptual design to build solutions and applications
- Responsible for writing code to create and maintain cloud application

IBM Cloud Security Engineer

- Detects risk and protects vulnerable systems to keep clients and customers safe in the cyberworld
- Responds to security incident escalations and proactively engineers security and compliance best practices

IBM Cloud Site Reliability Engineer

- Ensures users have successful interactions by analyzing and learning from system issues to automate IT operations and improve system availability and reliability
- Helps clients build a modern network operations center

IBM Cloud Sales Engineer

- Assists clients in creating action plans to help them resolve critical business problems
- Accountable for partner enablement goals by driving innovative technical programs and overseeing day-to-day technical account-level activities

1.4: Job Roles that Support Cloud Check Your Knowledge



Question 1

What IBM Cloud role designs cloud solutions?

- A. IBM Cloud Site Reliability Engineer
- B. IBM Cloud Architect
- C. IBM Cloud Developer
- D. IBM Cloud Security Engineer

➔ **Answer B.** IBM Cloud Architects recommend and design cloud solutions to solve client problems.

1.4: Job Roles that Support Cloud Check Your Knowledge



Question 2

What IBM Cloud role assists clients in creating action plans to help them resolve critical business problems?

- A. IBM Cloud Architect
- B. IBM Cloud Site Reliability Engineer
- C. IBM Cloud Sales Engineer
- D. IBM Cloud Security Engineer

➔ **Answer C.** IBM Cloud Sales Engineers assist clients in creating action plans to help them resolve critical business problems.

1.4: Job Roles that Support Cloud Check Your Knowledge



Question 3

What IBM Cloud role automates IT operations and improves system availability and reliability?

- A. IBM Cloud Architect
- B. IBM Cloud Site Reliability Engineer
- C. IBM Cloud Developer
- D. IBM Cloud Security Engineer

➔ **Answer B.** IBM Cloud Site Reliability Engineers automate IT operations and improve system availability and reliability.

1.4: Job Roles that Support Cloud Check Your Knowledge



Question 4

What IBM Cloud role can assist a client with the build a modern network operations center?

- A. IBM Cloud Developer
- B. IBM Cloud Site Reliability Engineer
- C. IBM Cloud Sales Engineer
- D. IBM Cloud Security Engineer

➔ **Answer B.** IBM Cloud Site Reliability Engineers can help clients build a modern network operations center.

1.4: Job Roles that Support Cloud Check Your Knowledge



Question 5

What IBM Cloud role is responsible for writing code to create and maintain cloud applications?

- A. IBM Cloud Sales Engineer
- B. IBM Cloud Site Reliability Engineer
- C. IBM Cloud Security Engineer
- D. IBM Cloud Developer

➔ **Answer D.** IBM Cloud Developers are responsible for writing code to create and maintain cloud applications.

Acronyms

Acronym	Acronym Expansion
API	Application Programming Interface
ARPNET	Advanced Research Projects Agency Network
AWS	Amazon Web Services
DevOps	Development - Operations
IBV	Institute for Business Value
IT	Information Technology
ITG	Information Technology Governance
NFV	Network function virtualization
NIST	National Institute of Standards and Technology
OS	Operating system
PC	Personal computer
SaaS	Software-as-a-Service
SDN	Software-define networking
VM	Virtual machine