

Preparation Guide

Cloud computing Foundation

Edition August 2011



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1. Introduction

Cloud computing is about providing IT related services through the internet. Cloud computing allows flexible IT solutions to support the business, based on clear service arrangements.

| | |
|--------------------------------|---|
| Content | The Cloud computing Foundation certificate requires an overview of the field and its relationship with other areas of information management. Such an overview is based on knowledge of the fundamental concepts of Cloud computing and understanding of deployment, architecture and design of the Cloud computing Platform. |
| Target group | Cloud computing Foundation is intended for everyone playing a role or having an interest in the use and management of internet based IT services. This includes staff from internal and external service providers, their customers, and their managers. |
| Context | The exam Cloud computing Foundation is part of the EXIN qualification program and has been developed in cooperation with international experts in the field. |
| Prerequisite(s) | None |
| Study load | 60 hours |
| Training | The maximum number of participants is 25. (This does not apply to online training courses.) |
| Contact hours | The minimum number of contact hours for this training course is 15. This includes group assignments, exam preparation and short breaks. This number of hours does not include homework, logistics for exam preparation and lunch breaks. |
| Practical assignment(s) | Not applicable |
| Exam format | Computer-based or paper-based multiple-choice questions |
| Exam duration | 60 minutes |
| Exam details | Number of questions: 40 Pass mark: 65% (26 out of 40) Open book/notes: no Electronic equipment/aides permitted: no |
| Sample exam | You can download a sample exam at www.exin.com . |
| Training provider | You can find our accredited training providers at www.exin.com . |

2. Exam Requirements

The exam requirements are specified in the exam specifications. The following table lists the topics of the module (exam requirements). The weight of the different topics in the exam is expressed as a percentage of the total.

| Exam requirement | Exam specification | Weight (%) |
|--|---|------------|
| 1. The principles of Cloud computing | | 30 |
| | 1.1 The concept of Cloud computing | |
| | 1.2 The evolution of Cloud computing | |
| | 1.3 Cloud computing architectures | |
| | 1.4 Benefits and limitations of Cloud computing | |
| 2. Using the Cloud | | 15 |
| | 2.1 Accessing the Cloud | |
| | 2.2 Mobility and the Cloud | |
| 3. Security and Identity management | | 20 |
| | 3.1 Securing in the Cloud | |
| | 3.2 Identity management | |
| 4. Implementing and managing Cloud computing | | 20 |
| | 4.1 Building local Cloud networks | |
| | 4.2 Supporting the use of Cloud computing | |
| | 4.3 Standards in Cloud computing | |
| 5. Evaluation of Cloud computing | | 15 |
| | 5.1 The business case | |
| | 5.2 Evaluating implementations | |
| Total | | 100 |

Exam specifications

1. The principles of Cloud computing (30%)

1.1 The candidate understands the concept of Cloud computing (5%)

The candidate can:

- 1.1.1 Describe what Cloud computing is
- 1.1.2 Describe what virtualization is
- 1.1.3 Describe the main types of Cloud computing

1.2 The candidate knows the evolution of Cloud computing (10%)

The candidate can:

- 1.2.1 Describe the main concepts from which Cloud computing developed
- 1.2.2 Describe the role of network and servers in Cloud computing
- 1.2.3 Describe the role of the Internet in Cloud computing
- 1.2.4 Describe the role of Virtualization in Cloud computing
- 1.2.5 Describe the role of managed services in Cloud computing

1.3 The candidate understands the Cloud computing architectures (10%)

The candidate can:

- 1.3.1 Describe the Service Oriented Architecture
- 1.3.2 Describe the Tiered, Multipurpose and the Datacenter architecture

1.4 The candidate knows benefits and limitations of Cloud computing (5%)

The candidate can:

- 1.4.1 Identify the main benefits of Cloud computing
- 1.4.2 Identify the main limitations of Cloud computing

2. Using the Cloud (15%)

2.1 The candidate knows how users can access the Cloud (8%)

The candidate can:

- 2.1.1 Describe how to access Web Applications through a Web Browser
- 2.1.2 Describe the Cloud Web Access Architecture
- 2.1.3 Describe the use of a Thin Client

2.2 The candidate understands the use of mobile devices to access the Cloud (7%)

The candidate can:

- 2.2.1 Describe the basic platforms available for mobile operating devices
- 2.2.2 Describe the role of standard applications in collaboration
- 2.2.3 Describe the main benefits and limitations of mobile access to the Cloud

3. Security and Identity Management (20%)

3.1 The candidate understands the security risks of Cloud computing and knows mitigating measures (10%)

The candidate can:

- 3.1.1 Describe the essential elements of security in the cloud (Confidentiality, Integrity and Availability)
- 3.1.2 Describe the standard measures for authorized use (Authentication, Authorization and Accountability)
- 3.1.3 Describe the main security risks for the three types of virtualized environments

3.2 The candidate understands identity management in the Cloud (10%)

The candidate can:

- 3.2.1 Describe the use of Federation
- 3.2.2 Describe the use of presence data
- 3.2.3 Describe the main aspects of Identity management
- 3.2.4 Describe privacy and compliance issues and safeguards in Cloud computing

4. Implementing and Managing Cloud computing (20%)

4.1 The candidate understands the building of Local Cloud Networks (5%)

The candidate can:

- 4.1.1 Describe the benefits and cost elements of a local cloud environment
- 4.1.2 Describe the main components of a local cloud environment and how they are interconnected
- 4.1.3 Describe the risks of connecting a local cloud network to the public internet

4.2 The candidate understands supporting the use of Cloud computing (5%)

The candidate can:

- 4.2.1 Describe the use of Virtual Private Network access to a Local Area Network
- 4.2.2 Describe the use of scripting and content-formatting languages and provide examples of such languages
- 4.2.3 Describe approaches for back-up and recovery in an environment using Cloud computing

4.3 The candidate knows the main standards and protocols in Cloud computing (10%)

The candidate can:

- 4.3.1 Describe the main objectives and benefits of using standards in Cloud computing
- 4.3.2 Describe the role of international and industrial standard organizations
- 4.3.3 Describe WBEM, DMFT, SMI-S, SMASH, HTTP
- 4.3.4 Describe the use of security protocols (IPSec, OpenID)

5. Evaluation of Cloud computing (15%)

5.1 The candidate understands the business case for Cloud computing (10%)

The candidate can:

- 5.1.1 Describe the costs and possible savings of Cloud computing
- 5.1.2 Describe the main operational and staffing benefits of Cloud computing

5.2 The candidate understands evaluation of cloud computing implementations (5%)

The candidate can:

- 5.2.1 Describe the evaluation of performance factors, management requirements and satisfaction factors
- 5.2.2 Describe the evaluation of service providers and their services in Cloud computing

3. Exam Terms

This chapter contains the terms with which candidates should be familiar. Terms are listed in alphabetical order. For concepts whose abbreviation and full name are included in the list, both can be examined separately.

Please note that knowledge of these terms alone does not suffice for the exam; the candidate must understand the concepts and be able to provide examples.

Active Directory (controller)
Application
Application hosting
Audit
Authentication
Availability
Back-up
Back-up service
Bandwidth
Bits per second (bps)
Blog
Business logic
Bytes per second (Bps)
Cell phone
Claim based solution
Client
Client-Server
Cloud Access architecture
Cloud computing
Cloud presence
Common carrier
Common Internet File System (CIFS)
Communication-as-a-Service (CaaS)
Compliance-as-a-service
Confidentiality
Cost

Customer
Customer Relation Management tool
Data center
Database
Datacenter architecture
Distributed Denial of Service (DDOS)
Denial-of-service attack
Deployability
Digital identity
Distributed Management Task Force (DMTF)
Drop box
E-commerce
Economical benefit
E-mail
Encrypted federation
Extensible Markup Language (XML)
Extensible Messaging and Presence Protocol (XMPP)
Extranet
Failover
Federation
Frame relay network
Green IT
Guest operating system
Hardware
Hybrid cloud
Hyper Text Markup Language (HTML)
Hypervisor
Identity
Identity management
Identity-as-a-Service (IDaaS)
Infrastructure-as-a-Service (IAS)
Infrastructure-as-a-Service (IaaS)
Instance messaging (IM)
Instant Messaging and Presence Service (IMPS)
Institute for Electrical and Electronics Engineers (IEEE)

Integrity
International Standards Organization (ISO)
Internet Protocol Security (IPSec)
Interoperability
Intranet
IT Infrastructure
IT Service
JavaScript
JavaScript Object Notation (JSON)
Latency
Load-balancer
Local Area Network (LAN)
Location independent
Mainframe
Man-in-the-middle attack
Memory
Messaging protocol
Microcomputer
Middleware
Migration
Minicomputer
Mobile device
Mobility
Monitoring-as-a-Service (MaaS)
Multimedia Message Service (MMS)
Multiprocessing
Multi-programming
Multipurpose architecture
Multi-sides
Multi-user
National Security Agency (NSA)
Network
Network Attached Storage (NAS)
Network Infrastructure
Network protocol

Online games
Open Cloud Consortium (OCC)
Open System Interface (OSI)
Open Virtualization Format (OVF)
Open-ID
Operating System
Operational benefit
Pay-as-you-go model
Performance factors
Permissive federation
Personal Identifiable Information
Platform-as-a-Service (PaaS)
Portability
Pretty Good Privacy (PGP)
Privacy
Privacy notice
Private cloud
Processing
Protocol Analyzer
Public cloud
Recovery
Redundancy
Remote datacenter
Replication
Risk
Satisfaction factors
Scalability
Scripting language
Security
Server
Service level
Service level agreement (SLA)
Service Oriented Architecture (SOA)
Short Message Service (SMS)
Single sign-on

Slide share
Smartphone
Social media
Software
Software-as-a-service (SaaS)
Staffing benefit
Stakeholder
Storage
Storage Management Initiative-Specification (SMI-S)
Subcontracted supplier
Supplier management
Supplier contract
Support
System Management Architecture for System Hardware (SMASH)
Thin client
Throughput
Tiered architecture
Time to Value
Time-to-market
Total Cost of Ownership (TCO)
Traceability
Track
Transmission Control Protocol / Internet Protocol (TCP/IP)
Trusted federation
Underpinning contract (UC)
Uniformity
User
Utility
Verified federation
Video telecommunication
Virtual Machine (VM)
Virtual Private Network (VPN)
Virtualization
Virtualization Management Initiative (VMAN)
Virtualized environment

Virus (infection)
Voice-over-IP (VoIP)
Web browser
Web frontend
Web Service Management (WS-MAN)
Web-based Enterprise Management (WBEM)
Webmail
Website
Wiki
Wikispaces
Workload

4. Exam Literature

The exam requirements of EXIN Cloud computing Foundation are based on the training material available for EXIN accredited trainers.

- A** EXIN (ed)
Cloud computing Foundation, basic training material
EXIN, 2011

The following book is useful as a general introduction:

- B** Chris Harding
Cloud Computing For Business, The Open Group Guide
Van Haren Publishing, 2011
ISBN: 978 90 8753 657 2

Literature and exam specifications

| EXAM MATRIX/TAXONOMY | | | | LITERATURE REFERENCES | |
|----------------------|--------------------|---------------|----------|-----------------------|----------------------|
| Exam Requirement | Exam Specification | | Weight % | Literature Id | Literature Reference |
| | Mastery level | Testing level | | | |
| 1 | 1.1 | 1.1.1-1.1.3 | 5 | A: | 2.1 |
| | 1.2 | 1.2.1-1.2.5 | 10 | A: | 2.2 |
| | 1.3 | 1.3.1-1.3.3 | 10 | A: | 2.3 |
| | 1.4 | 1.4.1-1.4.3 | 5 | A: | 2.4 |
| 2 | 2.1 | 2.1.1-2.1.3 | 8 | A: | 3.1 |
| | 2.2 | 2.2.1-2.2.3 | 7 | A: | 3.2 |
| 3 | 3.1 | 3.1.1-3.1.3 | 10 | A: | 4.1 |
| | 3.2 | 3.2.1-3.2.4 | 10 | A: | 4.2 |
| 4 | 4.1 | 4.1.1-4.1.3 | 5 | A: | 5.1 |
| | 4.2 | 4.2.1-4.2.3 | 5 | A: | 5.2 |
| | 4.3 | 4.3.1-4.3.5 | 10 | A: | 5.3 |
| 5 | 5.1 | 5.1.1-5.1.2 | 10 | A: | 6.1 |
| | 5.2 | 5.2.1-5.2.2 | 5 | A: | 6.2 |

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