

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.

<b>Content</b>	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.
<b>Target group</b>	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.
<b>Context</b>	The exam Cloud computing Foundation is part of the EXIN qualification program and has been developed in cooperation with international experts in the field.
<b>Prerequisite(s)</b>	None
<b>Study load</b>	60 hours
<b>Training</b>	The maximum number of participants is 25. (This does not apply to online training courses.)
<b>Contact hours</b>	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.
<b>Practical assignment(s)</b>	Not applicable
<b>Exam format</b>	Computer-based or paper-based multiple-choice questions
<b>Exam duration</b>	60 minutes
<b>Exam details</b>	Number of questions: 40 Pass mark: 65% (26 out of 40) Open book/notes: no Electronic equipment/aides permitted: no
<b>Sample exam</b>	You can download a sample exam at <a href="http://www.exin.com">www.exin.com</a> .
<b>Training provider</b>	You can find our accredited training providers at <a href="http://www.exin.com">www.exin.com</a> .

## 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	
<b>Total</b>		<b>100</b>

## 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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