



# Huawei ICT Competition 2023-2024 Exam Outline

## Practice Competition - Cloud Track

### 1. Overview

Competition Stage	Exam Type	Duration	Number of Questions	Question Type	Total Score	Number of Contestants	Note
Preliminary stage (Mandatory)	Written	90 minutes	60	True or false questions, single-answer questions, and multiple-answer questions	1000	Individual	From January 1, 2023 to the end date of the regional preliminary, 50 bonus points will be acquired for passing any of HCIA-Cloud/Big Data/AI certification, 100 bonus points for any of HCIP-Cloud/Big Data/AI certification, and 200 bonus points for any of HCIE-Cloud/Big Data/AI certification. These bonus points can be combined up to a maximum of 200 points. <b>Important:</b> The Uniportal account used for the competition registration must be the same as that for the certification. Otherwise, no bonus point can be given.
National stage (Optional)	Written	90 minutes	90	True or false questions, single-answer questions, and multiple-answer questions	1000		
Regional stage	Written	60 minutes	60	True or false questions, single-answer questions, and multiple-answer questions	1000	3 (as a team)	In regional stage, each of the three contestants in a team needs to complete the test questions for the written exam, and they will together complete the tasks for the lab exam. One team can submit only one set of answers for each of their written and lab exams. Total score = 30% x Average written exam score of the team + 70% x Comprehensive lab exam score.
	Lab	4 hours	/	Comprehensive lab	1000		
Global stage	Lab	8 hours	/	Comprehensive lab	1000		

### 2. Weighting

Competition Stage Direction	Preliminary stage	National stage	Regional stage	Global stage
Cloud	40%	40%	40%	40%
Big data	20%	20%	15%	15%
AI	40%	40%	45%	45%

### 3. Scope

#### 3.1. Overview of Exam Contents

The Cloud Track exam contents cover knowledge about cloud, AI, and big data, including but not limited to the knowledge of cloud computing, cloud native, Huawei Cloud products and services, Huawei Cloud solutions, basics of big data, basic principles and applications of big data components, big data mining, AI technologies and applications, machine learning, deep learning, computer vision, and Natural Language Processing (NLP).

#### 3.2. Knowledge to Be Tested

Direction	Category	Key Items	Description	Regional Preliminary	Regional Rematch	National Final	Global Final	
				HCIA	HCIP	HCIE	HCIE or above	
Cloud	Cloud computing concepts	IT developments	Concept of IT evolution: physical environment > virtual environment > private cloud/public cloud	√	√	√	√	
		Cloud computing concepts	Development, definition, value, and classification of cloud computing	√	√	√	√	
		Private cloud concepts	Private cloud concepts, mainstream vendors and products, and application scenarios	√	√	√	√	
		Public cloud concepts	Public cloud concepts, mainstream vendors and products, and application scenarios	√	√	√	√	
	Public cloud service operations	Huawei Cloud	Huawei Cloud overview, Huawei Cloud application scenarios, Huawei Cloud ecosystem, introduction to AZs, regions, Identity and Access Management (IAM), projects, and Huawei Cloud billing modes	√	√	√	√	
		Compute services	Compute service overview, Elastic Cloud Server (ECS), Image Management Service (IMS), and Auto Scaling (AS)	√	√	√	√	
		Cloud network services	Similarities and differences between traditional networks and cloud networks, VPC technologies, security groups, Access Control List (ACL), Elastic IP (EIP), and Elastic Load Balance (ELB)	√	√	√	√	
		Cloud storage services	Data storage concepts and development, cloud storage concepts, classification, and application scenarios, and concepts, technical principles, and usage of Object Storage Service (OBS), Elastic Volume Service (EVS), Scalable File Service (SFS), and Cloud Backup and Recovery (CBR)	√	√	√	√	
		Cloud database services	Database overview and development, relational database concepts, cloud database introduction, Relational Database Service (RDS), non-relational database service, and database backup	√	√	√	√	
		Cloud O&M	Cloud O&M overview and tools, and concepts, technical principles, and usage of Cloud Eye (CES), Cloud Trace Service (CTS), Log Tank Service (LTS), and IAM	√	√	√	√	
		Cloud security	Web Application Firewall (WAF), Host Security Service (HSS), Vulnerability Scan Service (VSS), Data Encryption Workshop (DEW), and Cloud Bastion Host (CBH)	√	√	√	√	
		Application O&M	Application Operations Management (AOM), Application Performance Management (APM), and Application Service Mesh (ASM)	√	√	√	√	
		Cloud migration of application systems	Planning and design, and application migration to the cloud	√	√	√	√	
		Cloud native basic services	Cloud native concepts	Cloud native concepts, including the development, definition, features, models, benefits, application scenarios, and future trends	√	√	√	√
Cloud native infrastructure - Container technology	Huawei Cloud container service, including concepts, technical principles, and usage of containers, container engines, container images, container repositories, Kubernetes concept and architecture, Kubernetes orchestration, and Huawei Cloud Cloud Container Engine (CCE)		√	√	√	√		
Cloud native application building	Microservice concepts	Huawei Cloud serverless service, including the concepts, forms, advantages, and benefits, and technical principles and applications of FunctionGraph	√	√	√	√		
	Cloud native application building	Application development & governance services, including the concepts, technical principles, and usage of Cloud Service Engine (CSE) and ServiceStage	√	√	√	√		
Big data	Big data storage and processing	Basic concepts	Basic concepts and characteristics of big data, development trend of the big data industry, and Huawei Kunpeng big data	√	√	√	√	
		Common big data components	Basic technical principles of common and important big data components, including HDFS, HBase, Hive, ClickHouse, MapReduce, YARN, Spark, Flink, Flume, Kafka, Elasticsearch, and ZooKeeper	√	√	√	√	
		MapReduce Service (MRS)	Introduction to the Huawei big data platform MRS and its architecture design and core features, purchase and use, and application development	√	√	√	√	
		Scenario-specific big data solutions	Scenario-specific big data offline processing, real-time big data retrieval, and real-time big data stream processing solutions	√	√	√	√	
		Data lake solution	Data lake concepts and solution of data import into the lake	√	√	√	√	
		Data governance	Data governance methodology	√	√	√	√	
	Data mining	Data preprocessing	Data preprocessing, including missing values, abnormal values, duplicate values, unbalanced data processing, and skew data processing	√	√	√	√	
		Feature engineering	Feature selection, including Filter, Wrapper, and Embedded	√	√	√	√	
		Supervised learning	Supervised learning, including regression algorithms, classification algorithms, and integration algorithms	√	√	√	√	
		Unsupervised learning	Unsupervised learning, including clustering algorithms, association algorithms, and dimensionality reduction algorithms	√	√	√	√	
AI	AI basics	Model evaluation and optimization	Model evaluation and optimization, including model selection and algorithm evaluation metrics	√	√	√	√	
		PySpark MLlib data mining	PySpark MLlib classification and regression, clustering and dimensionality reduction, association rules and recommendation algorithms, and evaluation matrix	√	√	√	√	
		Basic AI concepts	AI-related concepts, development, and applications	√	√	√	√	
	AI algorithm	AI technology fields	AI research fields include computer vision, Natural Language Processing (NLP), and automatic speech recognition (ASR).	√	√	√	√	
		Cutting-edge AI technologies and scenarios	Trends and scenarios of cutting-edge AI technologies, including autonomous driving, quantum machine learning, reinforcement learning, and knowledge graph	√	√	√	√	
		Machine learning	Traditional machine learning algorithms, ensemble learning algorithms (boosting and bagging), hyperparameter search algorithms, model evaluation, and model validity (overfitting and underfitting)	√	√	√	√	
		Deep learning	Deep learning algorithms (including fully-connected neural networks, CNN, RNN, LSTM, and GAN), loss function, gradient descent, neural network calculation process, optimizer and activation function, and regularization Common problems and handling, including gradient disappearance and data sample imbalance	√	√	√	√	
	AI application development	Huawei AI development platform	Huawei AI full-stack and all-scenario application	Huawei Cloud ModelArts, Ascend processors, and Atlas AI solutions	√	√	√	√
			Huawei Cloud AI development platform	Huawei Cloud AI development platform, including data labeling, ExeML, cloud development environment, algorithm management, training management, and application deployment	√	√	√	√
		MindSpore development framework	AI development framework	The MindSpore architecture and the all-scenario application of the MindSpore framework	√	√	√	√
			MindSpore basics and usage	MindSpore operating environment configuration and basics (tensor construction, data types and type conversion, and use of common functions and classes), data operations (dataset construction, data transformation, data enhancement, etc.), network construction, model training, saving, and loading	√	√	√	√
			MindSpore features	Use of dynamic graphs and static graphs, and implementation of inference and deployment on devices and cloud	√	√	√	√
		AI application development	MindSpore development process and components	MindSpore AI application development process MindSpore components: MindSpore Serving, MindSpore Lite, and MindSight	√	√	√	√
			Computer vision	Digital image processing Computer vision tasks: image classification, image segmentation, and target detection Common computer vision algorithms: ResNet, YOLO, and VGG Computer vision application development based on MindSpore	√	√	√	√
Voice processing	Voice signal preprocessing, voice processing tasks (such as voice recognition and text to speech), and voice processing application development based on MindSpore		√	√	√	√		
Natural Language Processing (NLP)	Text data processing, word embedding, NLP tasks (emotional classification, machine translation, named entity recognition), common NLP algorithms (Transformer, Bert, and ELMO), and NLP application development based on MindSpore	√	√	√	√			

#### Note

This Exam Outline is for reference only. It does not cover all exam details.