Huawei ICT Competition 2022-2023 Exam Outline

Computing Track

1. Overview

1.1. Computing Track of Huawei ICT Competition Preliminary Stage Overview

Competition Stage	Exam Type	Duration	Number of Questions	Question Type	Total Score
Preliminary Stage	Written	90 Minutes	60	True/False Question, Single-Choice Question and Multiple-Choice Question	1000

1.2. Computing Track of Huawei ICT Competition National Stage Overview

Competition Stage	Exam Type	Duration	Number of Questions	Question Type	Total Score
National Stage	Written	90 Minutes	90	True/False Question, Single-Choice Question and Multiple-Choice Question	1000

Note: From the date of successful registration to the end date of the national stage, 10 bonus points will be acquired for passing any of HCIA-openEuler/openGauss certifications, with the maximum of 100 points.

1.3. Computing Track of Huawei ICT Competition Regional Stage Overview

Competition Stage	Exam Type	Duration	Number of Questions	Question Type	Number of Contestants	Total Score
Regional Stage	Written	60 Minutes	60	True/False Question, Single-Choice Question and	3 (Personnel)	1000

				Multiple-Choice Question		
	Lab	4 Hours	/	/	3 (as a team)	1000

Remark: The final score=30% * the average score of the written exam of 3 examinees in the same team + 70% * the score of the lab exam of the team.

1.4. Computing Track of Huawei ICT Competition Global Stage Overview

Competition Stage	Exam Type	Duration	Number of Contestants	Question Type	Total Score
Global Final	Lab	8 Hours	3 (as a team)	/	1000

2. Weight

2.1. Computing Track of Huawei ICT Competition Preliminary Stage Weighting

Competition Stage	Direction	Weight
Preliminary Stage	openEuler	50%
	openGauss	50%

2.2. Computing Track of Huawei ICT Competition National Stage Weighting

Competition Stage	Direction	Weight
National Stage	openEuler	50%
	openGauss	50%

2.3. Computing Track of Huawei ICT Competition Regional Stage Weighting

Competition Stage	Direction	Weight

Regional Stage	openEuler	50%
	openGauss	50%

2.4. Computing Track of Huawei ICT Competition Global Stage Weighting

Competition Stage	Direction	Weight
Global Stage	openEuler	50%
	openGauss	50%

3. Scope

3.1. Overview of Exam Contents

The Computing Track exam contents cover openEuler and openGauss. Main exam contents include but are not limited to openEuler development history, the basic operations, memory management, process management, file systems, firewall, and security hardening on openEuler, Kunpeng architecture basics, openGauss overview, connection and access, routine use of the database, cluster management, fully-encrypted database, tamper-proof database, and O&M monitoring.

3.2. Knowledge to Be Tested

openEuler:

1. openEuler overview, including the development history, basic concepts, and main features of openEuler;

2. Basic openEuler operations, including openEuler installation and login methods, bash shell usage and common operations, usage of the vi and Vim text editors, management of users, user groups, and permissions on openEuler, application software installation using RPM, Yum, and DNF, storage space management, scheduled tasks, network and service management, and Samba file sharing server;

3. Architecture of the Kunpeng processor;

4. openEuler memory management, including the paging mechanism, management of physical and virtual pages, working principles of page tables and MMUs, conversion

between virtual and physical addresses, and differences between malloc, kmalloc, and vmalloc and their application scenarios;

5. openEuler process management, including the process address space layout and features, system call usage, relationship between system calls and library functions, system call principles, process scheduling concepts and algorithms, mechanisms for inter-process communication and process synchronization, and network models and protocols;

6. openEuler file systems, including file system concepts, basic file and file system operations, structure of the virtual file system (VFS), file systems on openEuler, and disk layouts of the Ext2/3/4 file systems;

7. openEuler firewall and security hardening, including the conventional read/write/execute (rwx) permission mechanism, iptables firewall usage, SELinux policies, common openEuler security hardening measures, and basic concepts, installation, and usage of secGear;

8. openEuler virtualization, including ARM virtualization principles, management of virtual machines (VMs) on openEuler, the StratoVirt virtualization solution, and the iSulad container solution;

9. openEuler system monitoring and performance tuning, including common system monitoring methods, features and principles of A-Tune, and principles of the KAE acceleration engine;

10. openEuler maintainability, including the features, principles, installation, and usage of the kernel live upgrade tool;

11. Common GCC compilation options on openEuler;

12. openEuler Devkit tool chain, including the application scenarios and usage of x2openEuler.

openGauss:

1. openGauss overview, including basic concepts, main features (such as DB4AI and AI4DB), and openGauss architecture.

2. openGauss database and object management, including the openGauss logical structure, storage engine selection, tablespace creation and management, users and roles, system catalogs and views, data import and export, and high-risk operations.

3. SQL basics, including SQL syntax classification, database operation services, and common functions.

4. openGauss installation and deployment, including single-instance installation and deployment, primary/standby HA deployment, cluster management components, and common failover.

5. openGauss performance optimization, including slow SQL diagnosis, key parameter optimization, and performance diagnosis and analysis.

6. openGauss security, including the use of fully-encrypted database and tamper-proof database.

7. openGauss connection and access, including pg_hba/SSL and remote access, password control policies, terminal tools, development tools, middleware, and programming languages.

8. Routine use of the openGauss database, including database development specifications, O&M management, and flashback.

Note:

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