

*Standards and
Assessment Guide*

Cloud Computing

Introduction

Welcome to the Standards and Assessment Guide (SAG), a comprehensive resource designed to support excellence in assessment practices for all skills competitions hosted at the WorldSkills Competition. A key component of the SAG is the commitment to continuous improvement through ongoing review, ensuring that these guides consistently reflect the latest industry innovations and high standards of assessment in an open and transparent manner.

Purpose

The primary purpose of this guide is to provide a structured framework for the consistent and fair assessment of each skill competition. It aims to ensure that all assessments are conducted with a high degree of accuracy, reliability, validity, and reflect global industry standards. By adhering to these guidelines, assessors can maintain the integrity of the competition and uphold the high standards associated with WorldSkills.

Note: this guide is not a replacement for the Marking Scheme and should only be used as a reference when required during the assessment process. Competitors are not allowed to have a copy of this SAG in the workshop in either digital or paper form.

Scope

This document covers general assessment practices applicable to a diverse range of industry sectors including:

- Manufacturing and Engineering Technology
- Information and Communication Technology
- Construction and Building Technology
- Transportation and Logistics
- Social and Personal Services
- Creative Arts and Fashion

Each skill competition has its unique requirements and benchmarks, which are detailed within sections of this guide. The consistency of assessment across each skill is the overarching principle, ensuring a unified approach to evaluating Competitor performance to the highest standards.

Key Components

The guide is structured into several key components, each addressing critical aspects of the assessment process:

Assessment Principles and Objectives

- Emphasis on fairness, transparency, and objectivity in assessments.
- Alignment with global industry standards and best practices.

Assessment Methods and Tools

- Description of various assessment methods in Measurement and Judgement.
- Guidance on the application of appropriate assessment tools and equipment (if applicable).

Criteria and Benchmarks

- Examples of assessment criteria and aspects for each skill, outlining the expected competencies and performance standards.
- Benchmarks for different levels of proficiency i.e. Judgement award range 0, 1, 2, 3 or Yes/No criteria alongside clear measurable descriptors.

Expert assessment requirements

- Completion of the Access Programme.
- Approved Curriculum Vitae (CV).
- Reaching **100%** Expert preparedness.
- Full participation of online and in-person Mandatory Assessment Training (MAT).
- Completion of practical assessment testing at the Competition.

Quality Assurance and Improvement

- Monitoring and evaluation: Ensuring assessments are carried out correctly and produce reliable results.
- Continuous improvement: Using feedback from Experts and Skill Competition Managers to enhance future assessments.
- Periodic review: Regularly updating processes to reflect current industry and WorldSkills standards.

Implementation

For effective implementation, this guide should be used for guidance purposes only and in parallel with the Technical Description for each skill. Experts are encouraged to familiarize themselves thoroughly with both the general guidelines and the particular requirements of their respective skill areas. Collaborative efforts between the Skill Management Team, Experts, and Competitors are vital for achieving the ultimate goal of global skills development.

Conclusion

The Standards and Assessment Guide embodies the commitment of the WorldSkills movement to nurturing talent and promoting the highest standards of vocational education and training worldwide. By providing clear and comprehensive guidance, we aim to empower Experts to conduct marking and assessment practices that are not only rigorous and equitable but also inspiring and transformative for all participants.

Thank you for your dedication to upholding these standards and contributing to the success of the WorldSkills Competition. Together, we can continue to champion skills excellence and celebrate the achievements of talented individuals from around the globe.

Skill 53 – Cloud Computing

Measurement

Measurement is used to assess accuracy, precision, and other performance that can be measured objectively. It is used where ambiguity must be avoided.

The total marks allocated to measurement marking may vary from competition to competition depending on the Test Project.

Aspect	WSOS section as per TD	Descriptor
Ratio of recommended deployment size to actual.	3, 5	0.2 <= [Cost Ratio] <= 1.0
Use of Caching	3, 5	Use of Application Cache, such as CloudFront
Recover more easily from both unintended user actions and application failures	7	S3 bucket versioning enabled
Convenient to troubleshoot network problems	7	VPC flow log enabled
Efficient way to categorize resources in different ways	7	EC2 instance tagged
Shorten system boot time	7	Use of self-baked AMI

Aspect	WSOS section as per TD	Descriptor
CloudWatch Alarm to monitor instance status	7	CloudWatch alarm defined for appropriate metrics
Providing detailed insights into request latency and identifying performance bottlenecks	3	API Gateway active tracing by X-Ray
Enhances security by protecting applications from common web exploits and vulnerabilities	4	WAF configured
Assign resources least-privilege security policies and permissions	4	No security groups having ingress rule which source is 0.0.0.0/0
Database security	4	DynamoDB/RDS encryption enabled
Better isolation for computing instances	4	EC2/Database in private subnets. Bastion Hosts with limited access used.
Data encryption	4	S3 bucket encryption enabled
Data encryption in flight	4	TTPS used for all communications between services

Aspect	WSOS section as per TD	Descriptor
Allows for detailed monitoring and troubleshooting of containerized applications	5	ECS Container Insight enabled
Better isolation and reduce blast radius	5	Multi subnets defined across AZs for each layer
Application able to serve public traffic across multiple local networks	5	Multiple subnets in application deployment
Efficiently distributing incoming network traffic	5	ALB used
Transaction timeout response rate per day	5	Total network request timeouts < 10%
Data Reliability	5	DynamoDB/RDS has regular backup configured
Caching content closer to users, reducing latency and enhancing scalability	6	CloudFront configured

Aspect	WSOS section as per TD	Descriptor
Automating deployment, scaling, and management of containerized applications	6	Use ECS Service
Daily overall response time average	6	< 4s response time
Availability	6	Percentage of messages accepted for process $\geq 90\%$
Identified infrastructure scales to meet demand.	6	Application auto-scales once Competitors are hands off

Judgement

Judgement is used to assess the quality of performance about which there may be small differences of view when applying the external benchmarks.

The Resources column in the table below may include all kinds/formats of resources such as: a link to a YouTube video, a website link, an illustration, a photo, a reference to a book, and so on. It needs to be as detailed as possible to show the differentiation between 0, 1, 2, 3.

Generic rules:

The assessment group comprises three Experts plus one Expert who acts as the supervisor. The supervising Expert will replace an Expert in the marking group to prevent compatriot marking.

The difference of the three Experts' scores may not exceed 1. If this is the situation the Experts must re-score until there is a maximum difference of 1. As long as the three Experts judge within 1, the result can be entered into the CIS.

The total marks allocated to judgement marking may vary from competition to competition depending on the Test Project.

Aspect – Assign resources least-privilege security policies and permissions

WSOS section as per TD	Score	Descriptor	Resource
4	0	No defined security policies	
	1	Only S3 are utilizing defined security policies	
	2	Only Instances are utilizing defined security policies	
	3	All services are utilizing defined and recommended security policies	

Aspect – ECR security configuration

WSOS section as per TD	Score	Descriptor	Resource
4	0	No defined security policies	
	1	ECR image tag immutable, Image scanning, Encryption (1/3)	
	2	ECR image tag immutable, Image scanning, Encryption (2/3)	
	3	ECR image tag immutable, Image scanning, Encryption (3/3)	

Aspect – Computing instances reliability and scalability

WSOS section as per TD	Score	Descriptor	Resource
5	0	ASG not used	
	1	ASG is used with no target tracing policy	
	2	ASG used and has target tracing policy	
	3	ASG used and has target tracing policy and scale based on alb requests	

