

53 Cloud Computing													
WorldSkills Occupational Standards													
Section	WSOS Marks							WSOS Marks	Aspect Marks	Variation			
1	Work organization and management							10.00	11.00	1.00			
2	Communication and interpersonal skills							10.00	7.00	3.00			
3	Problem solving, innovation, and creativity							20.00	18.00	2.00			
4	Security							20.00	22.00	2.00			
5	Reliability, scalability, and elasticity							20.00	18.00	2.00			
6	Performance and optimization							10.00	13.00	3.00			
7	Operational considerations							10.00	11.00	1.00			
								Total Variation		14.00			
Criteria													
ID	Name									Mark			
A	Cost Optimization									10.00			
B	Operation Excellence									20.00			
C	Security									25.00			
D	Reliability									18.00			
E	Performance Efficiency									22.00			
F	Sustainability									5.00			
Sub Criterion ID	Sub Criterion Name or Description	Day of Marking	Aspect Type M = Meas J = Judg	Aspect - Description	Judg Score	Extra Aspect Description (Meas or Judg) OR Judgement Score Description (Judg only)	Requirement (Measurement Only)	WSOS Section	Calculation Row (Export only)	Max Mark	Criterion A	Total Mark	10.00
A1	Cost Optimization - Day 1	1											

			M	Ratio of overall load to infrastructure deployment size		Ratio of recommended deployment size to actual. Full marks if .2 <= [CostRatio] <= 3.0		3		0.50			
			M	Ratio of overall load to infrastructure deployment size		Ratio of recommended deployment size to actual. Full marks if .2 <= [CostRatio] <= 2.0		3		1.00			
			M	Ratio of overall load to infrastructure deployment size		Ratio of recommended deployment size to actual. Full marks if .2 <= [CostRatio] <= 1.0		3		1.50			
A2	Cost Optimization - Day 2	2	M	Use of application caching solution.		Has CloudFront been configured?		2		2.00			
			M	Ratio of overall load to infrastructure deployment size		Ratio of recommended deployment size to actual. Full marks if .2 <= [CostRatio] <= 1.2		3		0.50			
			M	Ratio of overall load to infrastructure deployment size		Ratio of recommended deployment size to actual. Full marks if .2 <= [CostRatio] <= 0.7		3		1.00			
			M	Ratio of overall load to infrastructure deployment size		Ratio of recommended deployment size to actual. Full marks if .2 <= [CostRatio] <= 0.4		3		1.50			
			M	Use of application caching solution.		Has CloudFront been configured?		2		2.00			
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B1	Operational Excellence - Day 1	1											
			M	Recover more easily from both unintended user actions and application failures		Is S3 bucket versioning enabled ?	Yes/No	7		0.50			
			M	Convenient to troubleshoot network problems		Is VPC flow log enabled ?	Yes/No	7		1.00			
			M	Effient way to categorize resources in different ways		Is EC2 instance tagged ?	Yes/No	7		0.50			
			M	Shorten system boot time		Is there any self baked AMI ?	Yes/No	7		1.00			
			M	Cloudwatch Alarm to monitor instance status		Has Cloudwatch alarm defined mean full marks, No Cloudwatch alarm defined mean zero mark	Yes/No	7		1.00			
B2	Operational Excellence - Day 2	2											
			M	Recover more easily from both unintended user actions and application failures		Is S3 bucket versioning enabled ?	Yes/No	7		0.50			
			M	Convenient to troubleshoot network problems		Is VPC flow log enabled ?	Yes/No	7		1.00			
			M	Effient way to categorize resources in different ways		Is EC2 instance tagged ?	Yes/No	7		0.50			
			M	Use network sharing file system		Is EFS used ?	Yes/No	7		0.50			
			M	Sufficient logging for key EKS components		Is there at least 1 EKS logging type exsiting ?	Yes/No	7		0.50			

			M	Cloudwatch Alarm to monitor instance status		Has Cloudwatch alarm defined mean full marks, No Cloudwatch alarm defined mean zero mark		7		1.00			
B3	Operational Excellence - Day 3	3											
			M	Challenge1		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge1		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge1		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	1		1.00			
			M	Challenge1		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	1		1.00			
			M	Challenge2		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	2		0.50			
			M	Challenge2		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	2		0.50			
			M	Challenge2		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	2		1.00			
			M	Challenge2		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	2		1.00			
			M	Challenge3		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge3		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge3		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	3		1.00			
			M	Challenge3		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	3		1.00			
B4	Operational Excellence - Day 4	4											
			M	Challenge4		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	7		0.50			
			M	Challenge4		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	7		0.50			
			M	Challenge4		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	7		1.00			
			M	Challenge4		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	7		1.00			

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C1	Security - Day 1	1											
			M	Assign resources least-privilege security policies and permissions		Is there less than 2 securiy groups having ingress rule which source is 0.0.0.0/0 ?	Yes/No	4		0.50			
			M	Assign resources least-privilege security policies and permissions		Is there securiry group open port 22 to internet ?	Yes/No	4		0.50			
			M	Database security		Is DynamoDB encryption enabled?	Yes/No	4		0.50			
			M	Better isolation for computing instances		Is EC2 (besides bastion host) in private subnets ?	Yes/No	4		0.50			
			M	Data encryption		Is S3 bucket encryption enabled ?	Yes/No	4		0.50			
			M	Data encryption in flight		HTTPS URL submitted mean full marks, HTTP URL submitted mean zero mark		4		0.50			
			J	Assign resources least-privilege security policies and permissions				4		0.50			
					3	All services (S3 and instances) are utilizing defined and recommended security policies							
					2	Only Instances are utilizing defined security policies							
					1	Only S3 are utilizing defined security policies							
					0	No defined security policies							
C2	Security - Day 2	2											
			M	Assign resources least-privilege security policies and permissions		Is there less than 2 securiy groups having ingress rule which source is 0.0.0.0/0 ?	Yes/No	4		0.50			
			M	Assign resources least-privilege security policies and permissions		Is there securiry group open port 22 to internet ?	Yes/No	4		0.50			
			M	Data encryption		Is S3 bucket encryption enabled ?	Yes/No	4		0.50			
			M	Limit the impact in the case of a leaked secret		Secret rotation enabled for the secrets in secret manager	Yes/No	4		0.50			
			M	API server endpoint access		API server endpoint access (public & private)	Yes/No	4		0.50			
			M	Data encryption in flight		HTTPS URL submitted mean full marks, HTTP URL submitted mean zero mark		4		0.50			
			J	ECR security configuration				4		0.50			
					3	ECR image tag immutable, Image scanning, Encryption (3/3)							
					2	ECR image tag immutable, Image scanning, Encryption (2/3)							
					1	ECR image tag immutable, Image scanning, Encryption (1/3)							
					0	No defined security policies							
C3	Security - Day 3	3											
			M	Challenge5		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge5		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	3		0.50			

			M	Challenge5	Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	3		1.00			
			M	Challenge5	Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	3		1.00			
			M	Challenge6	Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge6	Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge6	Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge6	Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge7	Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge7	Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge7	Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge7	Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	4		1.00			
C4	Security - Day 4	4										
			M	Challenge8	Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge8	Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge8	Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge8	Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge9	Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge9	Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge9	Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge9	Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge10	Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	4		0.50			

			M	Challenge10		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	4		0.50			
			M	Challenge10		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	4		1.00			
			M	Challenge10		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	4		1.00			
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D1	Reliability - Day 1	1											
			M	Better isolation and reduce blast radius		Are multi subnets defined accros Azs ?	Yes/No	5		0.50			
			M	Application able to serve public traffic across multiple local networks		Are there multiple subnets in application deployment?	Yes/No	5		0.50			
			M	Efficiently distributing incoming network traffic		Is ALB used ?	Yes/No	5		0.50			
			M	Transaction timeout response rate per day		Total network request timeouts < 10% receives full marks; < 20% receives half marks; < 40% receives quarter marks	Check timeout r	5		1.00			
			M	Data Reliability		Is DynamoDB has backup configured	Yes/No	5		1.00			
			J	Computing instances reliability and scalability				5		1.00			
					3	ASG used and has target tracing policy and scale based on alb requests							
					2	ASG used and has target tracing policy							
					1	ASG is used							
					0	ASG not used							
D2	Reliability - Day 2	2											
			M	Better isolation and reduce blast radius		Are multi subnets defined accros Azs ?	Yes/No	5		0.50			
			M	Application able to serve public traffic across multiple local networks		Are there multiple subnets in application deployment?	Yes/No	5		0.50			
			M	Efficiently distributing incoming network traffic		Is ALB used ?	Yes/No	5		0.50			
			M	Transaction timeout response rate per day		Total network request timeouts < 10% receives full marks; < 20% receives half marks; < 40% receives quarter marks	Check timeout r	5		1.00			
			M	Data Reliability		Has RDS backup been configured?	Yes/No	5		1.00			
			J	Computing instances reliability and scalability				5		1.00			
					3	ASG used and has target tracing policy and scale based on alb requests							
					2	ASG used and has target tracing policy							
					1	ASG is used							
					0	ASG not used							
D3	Reliability - Day 3	3											
			M	Challenge11		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	5		0.50			

			M	Challenge11		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	5		0.50			
			M	Challenge11		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	5		1.00			
			M	Challenge11		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	5		1.00			
D4	Reliability - Day 4	4											
			M	Challenge12		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	5		0.50			
			M	Challenge12		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	5		0.50			
			M	Challenge12		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	5		1.00			
			M	Challenge12		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	5		1.00			
			M	Challenge13		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	5		0.50			
			M	Challenge13		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	5		0.50			
			M	Challenge13		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	5		1.00			
			M	Challenge13		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	5		1.00			
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E1	Performancre Efficiency - Day 1	1											
			M	Daily overall response time average		If less than 4 seconds mean full marks	< 4 seconds	6		0.50			
			M	Percentage of messages accepted for process >=90% (Availability)		Availability >90%		6		0.50			
			M	Percentage of messages accepted for process >=80% (Availability)		Availability 80% ~ 90%		6		0.50			
			M	Percentage of messages accepted for process >=70% (Availability)		Availability 70% ~ 80%		6		0.50			
			M	Percentage of messages accepted for process >=60% (Availability)		Availability 60% ~ 70%		6		0.50			
			M	Percentage of messages accepted for process >=30% (Availability)		Availability 30% ~ 60%		6		0.50			
			J	Overall performance measured by system score board				6		1.50			
					3	Players 1 to 3 on the score board get 1.5 point							

					2	Players 4 to 6 on the score board get 1 point													
					1	Players 7 and 8 on the score board get 0.5 point													
					0	All other player get 0 point													
E2	Performancree Efficiency - Day 2	2																	
			M	Daily overall response time average		If less than 4 seconds full marks	< 4 seconds	6		0.50									
			M	Add exception handling to simplify the flow of control		If larger than 10 full marks		6		1.00									
			M	Percentage of messages accepted for process >=90% (Availability)		Availability >90%		6		0.50									
			M	Percentage of messages accepted for process >=80% (Availability)		Availability 80% ~ 90%		6		0.50									
			M	Percentage of messages accepted for process >=70% (Availability)		Availability 70% ~ 80%		6		0.50									
			M	Percentage of messages accepted for process >=60% (Availability)		Availability 60% ~ 70%		6		0.50									
			M	Percentage of messages accepted for process >=30% (Availability)		Availability 30% ~ 60%		6		0.50									
			J	Overall performance measured by system score board				6		1.50									
					3	Players 1 to 3 on the score board get 1.5 point													
					2	Players 4 to 6 on the score board get 1 point													
					1	Players 7 and 8 on the score board get 0.5 point													
					0	All other players get 0 point													
E3	Performancree Efficiency - Day 3	3																	
			M	Challenge14		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	1		0.50									
			M	Challenge14		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	1		0.50									
			M	Challenge14		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	1		1.00									
			M	Challenge14		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	1		1.00									
			J	Overall performance measured by system score board				6		1.50									
					3	Players 1 to 3 on the score board get 1.5 point													
					2	Players 4 to 6 on the score board get 1 point													
					1	Players 7 and 8 on the score board get 0.5 point													
					0	All other players get 0 point													
E4	Performancree Efficiency - Day 4	4																	

			M	Challenge15		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge15		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge15		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	3		1.00			
			M	Challenge15		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	3		1.00			
			M	Challenge16		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge16		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	3		0.50			
			M	Challenge16		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	3		1.00			
			M	Challenge16		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	3		1.00			
			J	Overall performance measured by system score board				6		1.50			
					3	Players 1 to 3 on the score board get 1.5 point							
					2	Players 4 to 6 on the score board get 1 point							
					1	Players 7 and 8 on the score board get 0.5 point							
					0	All other players get 0 point							
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F4	Sustainability - Day 3	3											
			M	Challenge17		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge17		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge17		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge17		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	1		1.00			
F5	Sustainability - Day 4	4											
			M	Challenge18		Completed Less than all Clues used mean full marks, All Clues used mean zero mark	Yes/No	1		0.50			

			M	Challenge18		Completed <= 2 Clues used mean full marks, more than 2 clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge18		Completed <=1 Clues used mean full marks, more than 1 clues used mean zero mark	Yes/No	1		0.50			
			M	Challenge18		Completed 0 Clues used mean full marks, more than 0 clues used mean zero mark	Yes/No	1		1.00			