PORTFOLIO

Cloud Solutions Minor

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Inhoud

Rubric Cloud Solutions V1.0   Student name:Brian Dekker   Student nr:500718509
                               Date: 07-02-2022   Teacher:

1. General Cloud Solutions	Insufficient	Marginal	Good	Excellent	Proof
Cloud Computing	The student has no idea of the concepts involved in Cloud Computing	The student can explain at most two of the basic concepts involved in Cloud Computing among which *On-demand self-service* , *Resource pooling, Rapid elasticity* and *Measured service*	The student can explain in detail 3 concepts involved in Cloud Computing	*Additional to Good:* The student can explain in detail more than 5 concepts involved in Cloud Computing	
DevOps	The student has no idea of the processes and concepts involved in the life cycle of DevOps	The student can explain at most two of the processes involved in the life cycle of DevOps	The student can explain all four processes involved in in the life cycle DevOps	*Additional to Good:* The student can explain in detail all the advantages of a DevOps culture	
2. Business model Understand the usage patterns (or estimated usage patterns) and determine which of the providers best fits your business model, budget, timeline, and so on.					
Manage Change	The student has no idea how business processes or a product team could benefit from Cloud solutions	The student knows the characteristics of the business process or the product team involved in the Cloud solution	The student can explain how to empower a business process or a product team in such a way that they benefit the most of a an existing implementation of a Cloud solution	*Additional to Good:* The student is able to convince stakeholders in order to change business processes or product teams in such a way that they benefit the most of a an	

				existing implementation of a Cloud solution	
Costs and workload	The student has no idea of costs and workloads when it comes to comparing on premise versus Cloud solutions	The student can explain only the costs involved in a certain implementation of a cloud solution, not regarding the workload	The student can explain why a certain implementation of a Cloud solution is the best fit for a certain estimated usage pattern	*Additional to Good:* For all possible usage patterns the student can explain the best fit for a business model, budget and timelines	
3. <u>Solution Architecture</u> Advising stakeholders and translating business requirements into secure, scalable, and reliable cloud solutions.					
Programming	The student has no idea of the used coding scripts in a Cloud solution	The student can explain only coding scripts for implementing a Cloud solution, on which the student has prepared for	The student can explain all used coding scripts for implementing a Cloud solution, no matter the used Programming language or environment	*Additional to Good:* The student has taken care of the hand-over in terms of documenting all the coding scripts for implementing a Cloud solution in an easy accessible	
Storage and databases	The student has no idea of the pros and cons of different storage options	The student has only a basic understanding of different storage options like files, blob, SQL database and NOSQL	The student can explain both from a business as from a IT point of view the pros and cons of at least 3 different storage options from a certain provider	*Additional to Good:* The student can discuss in detail all options for structured on unstructured data and give practical advises in a real life situation based on all kinds of performance metrics	
Security	The student has only a basic understanding of security issues involved in using Cloud Solutions and IAM	The student can explain not more than 2 the different options for securing Cloud solutions and implementing IAM	The student can explain in detail at least 3 different options for securing Cloud solutions and implementing IAM	*Additional to Good:* The student can discuss in detail options for securing Cloud solutions and implementing IAM.	

			Moreover, the student can give practical advises in a real life situation	
4. Cloud Administration Learn how to configure and manage network capabilities like connectivity services, application protection, application delivery, and network monitoring services.					
Services, APIs and networking	The student can only mention services for storage, networking and compute services of the different services, but has no idea of the pros and cons of these services	The student can mention services for storage, networking and compute services and has some idea of the pros and cons of these services	The student can mention services for storage, networking and compute services and can explain in detail of the pros and cons of these services	Additional to Good: The student can explain how to optimize a combination of services in a real life situation	
Manageability	The student has no idea of metrics, management and orchestration tools involved in managing Cloud solutions	The student can mention some of the metrics, management and orchestration tools involved in managing Cloud solutions	The student can motivate in detail the metrics, management and orchestration tools involved in an existing implementation of a Cloud solution	Additional to Good: The student has an overview of all metrics, management and orchestration tools involved in the implementation of a Cloud solutions	

Professional skills	1	2	3	4	Proof
Future oriented organisation					
Problem solving research					
Personal Leadership					
Targeted interaction					

Requirements to pass the semester

All students needs to score

1. General, both Cloud Computing and DevOps, at least GOOD
2. Professional skills at least level 2

In addition, since students can set up their own learning stories, there are different possibilities but it will come down to

You'll need to score at least 2 rows good and 2 others marginal, but not all combinations are allowed

3. Business model
   a. Both aspects (= rows) of Business model good
   b. One aspect of Solution Architecture marginal
   c. One aspect of Cloud administration marginal

Or

4. Solution Architecture
   a. At least two out of three aspects of Solution Architecture good
   b. One aspect of Business model marginal
   c. One aspect of Cloud administration marginal

Or

5. Cloud administration

a. Both aspects of Cloud administration good
b. One aspect of Business model marginal
c. One aspect of Solution Architecture marginal

Grading

1. Failing the above requirements for either Business model, Solution Architect or Cloud Administration
   a. No score good at all ➔ 2
   b. Only one aspect of either Business model, Solution Architect or Cloud Administration is good, all others are insufficient ➔ 3
   c. Only one aspect of either Business model, Solution Architect or Cloud Administration is good, the other aspect of either Business model, Solution Architect or Cloud Administration is marginal, all others are insufficient ➔ 4
   d. All 2 aspects of either Business model, Solution Architect or Cloud Administration are good, one of the others is marginal and one of the others is insufficient ➔ 5

2. Passing the above requirements
   a. By the bare minimum ➔ 6
   b. Additional to a. : All 4 of the *General Competences* GOOD➔ 7
   c. Additional to b. :
      i. All 4 selected aspects of either Business model, Solution Architect or Cloud Administration are good ➔ 8
      ii. All 2 aspects of either Business model, Solution Architect or Cloud Administration are excellent, the others are marginal ➔ 8
   d. Additional to c. : All *General Competences* EXCELLENT ➔ 9
   e. All aspects through all requirements EXCELLENT ➔ 10

1.General Cloud Computing.

The student can explain in detail 3 concepts involved in Cloud Computing

Il refer to my Azure fundamentals folder on my github:

https://github.com/RamboBD/CloudMinorDocumenten/blob/main/Azure%20Fundamentals/Azure%20fundamentals.pdf

1.General DevOps.

The student can explain all four (8?) processes involved in in the life cycle DevOps

1. Plan
2. Code
3. Build
4. Test
5. Release
6. Deploy
7. Operate
8. Monitor

Plan

In this phase of the DevOps pipeline we determine what functionality is going to be build. It is often the job of the project manager to get together with the stakeholders and create a roadmap for the project and cut that roadmap into smaller pieces that will be planned into sprints.

Code

In this phase the engineers start working to build the functionality's. Often each engineer will take the responsibility to complete some small tasks that will later be combined to get to the finished product. When combining each other's work the engineer will evaluate each other's work so that errors or problems can be detected early into the process.

Build

After the engineer are done with the code and everything is combined the build phase starts. In this phase the code is compiled and the result of this is automatically deployed to the test environment. If unit test have been made they will automatically be executed in this phase to make sure no new problems arise.

Test

During the testing phase, automated and manual testing is performed to find bugs in the application before it goes into production. Depending on the changes and importance of the application, other tests, such as security or performance tests, can also be done at this stage.

Release

After successfully completing the testing phase, the application moves to the release phase. Depending on the organization and nature of the application, the application can be released immediately or on a fixed schedule. Depending on the organization, an application may not exit the approval stage until stakeholders agree to move on to the next stage.

Deploy

The deployment phase begins when the application is ready for deployment and the necessary agreements are reached. At this stage, the application is moved to the production environment. It is recommended to automate as many deployment steps as possible to avoid human error and ensure as little downtime as possible. Often decisions are made to keep old applications running while deploying new ones to avoid or minimize downtime.

Operate

After the deployment phase, the application is in production. It is important to ensure that sufficient resources are always available for the application to respond quickly even during peak hours.

Monitor

It is important to monitor the application closely. Based on usage data of the application and feedback from users, any problems and areas for improvement can be identified. The product manager can choose to pass these findings on to the developers, and the process starts all over again.

2.Solution Architecture Programming

The student has taken care of the hand-over in terms of documenting all the coding scripts for implementing a Cloud solution in an easy accessible

1. Function Apps
2. Logic Apps
3. Wiki
4. Servicebus

Function Apps.

Il refer to my function app folder on my github:

https://github.com/RamboBD/CloudMinorDocumenten/blob/main/Function%20Apps/Function%20apps%20Sprint%203.pdf

https://github.com/RamboBD/CloudMinorDocumenten/blob/main/Function%20Apps/Function%20apps%20Research%20story.pdf

Logic Apps.

Il refer to my logic app folder on my github:

https://github.com/RamboBD/CloudMinorDocumenten/blob/main/Logic%20App/Azure%20Logic%20Apps.pdf

Wiki.

Il refer to the Wiki we created on azure devops:

https://dev.azure.com/mydevAUAStest/Mixit/_wiki/wikis/Mixit.wiki/16/Mixit-Project-Wiki

My main contributions to this wiki are:

Servicebus.

Il refer to the servicebus folder on my github:

3.Solution Architecture Storage and Databases

The student can explain both from a business as from a IT point of view the pros and cons of at least 3 different storage options from a certain provider

1. Storage Account
2. CosmosDB
3. ServiceBus

Storage Account.

Il refer to the servicebus folder on my github:

https://github.com/RamboBD/CloudMinorDocumenten/tree/main/StorageAccount%2BCosmosDB

CosmosDB.

Il refer to the servicebus folder on my github:

https://github.com/RamboBD/CloudMinorDocumenten/tree/main/StorageAccount%2BCosmosDB

ServiceBus.

Il refer to the servicebus folder on my github:

https://github.com/RamboBD/CloudMinorDocumenten/tree/main/ServiceBus

3.Solution Architecture Security

The student can explain in detail at least 3 different options for securing Cloud solutions and implementing IAM

1. Managed Identity
2. SAS keys
3. Key Vault

Managed Identity

Managed identity's fix the issue of having to use secrets or certificates to access service principles. A service principle is a representation of a app instance. So let's say I want to use a Netflix AAD in my AAD(Azure Active Directory) it will create a service principle in my AAD that points to the Netflix AAD. Now for the app in my resource to use my AAD we need to connect the two one way of doing this is by using secret keys or certificates but we don't want to do that so we will use managed identity's instead.

In a resource you can turn on an identity that azure is going to manage.

When you turn this on it will create service principle in you AAD with the same name as the azure resource. Now this service principle and Resource are linked with a shared life cycle so if I delete the resource the SP is also deleted. Now if we create a second resource we can give permissions to Resource 1 service principle to do things in this resource with RBAC(Resource based access control).

Now there are two different types of managed identity's

System assigned

System assigned managed identity's are managed identity's that can only have one resource connected to it and a resource can only have one managed identity. The life cycle between the two is shared if you delete the resource the managed identity is also deleted. System identity is a One to One relationship with resources.
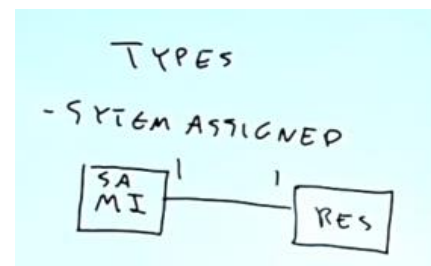
User assigned

With this managed identity the user creates a managed identity as a separate resource. A user can create a managed identity in a AAD and then assign it to multiple resources. So the life cycle between the two is different if you delete a resource the managed identity stays. So user identity is a many to many relationship with resources.
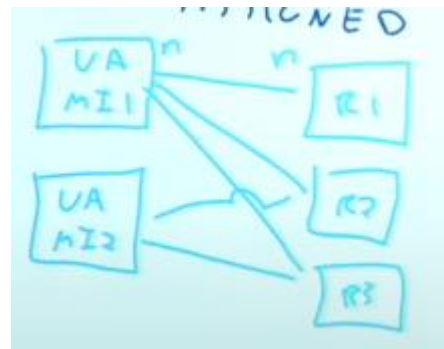
So let's say for example I have a storage account with some blob storage I can now create a managed identity and give it permission to read the blob data in that storage account now any resource that I give that manged identity to has permission to read the blob data.

Here is an example of a managed identity I created and use it to give my logic app permission to send data to my storage account and CosmosDB.

Here you can see that the logic app has the managed identity

SAS Keys

SAS policys are keys that you can use to connect to certain services in azure for example a service bus or queue within the service bus we used this in our project.

Here you can see a SAS policy we created so we can use it so send messages to this specific queue from the WebApp. We store these connection strings in a key vault.

Key Vault

A key vault is a service in azure where you can store secrets that you want to shield from the outside. For example we use the key vault to store our SAS policys (connection strings) that we use to connect to our services that need to work together like the webapp and the servicebus.
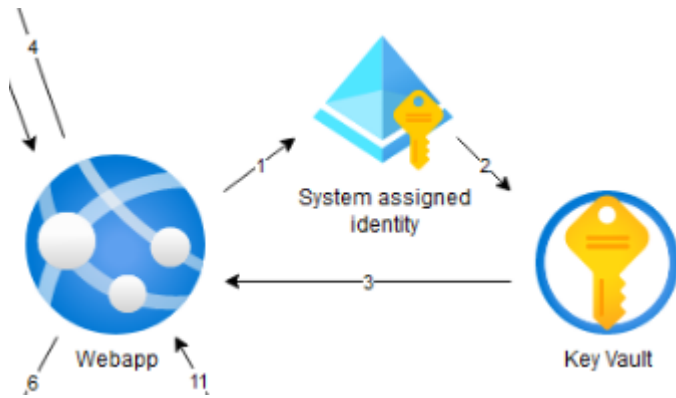
Code in webapp to get secrets from key vault

```python
# Azure KeyVault name + URL
keyVaultName = "MixitKeyVaultWebapp"
KVUri = f"https://{keyVaultName}.vault.azure.net"

# For auto selecting user/identity, if run local, it use users, if in webapp
on azure, it runs on managed identity of the webapp.
# credential = DefaultAzureCredential()
credential = AzureCliCredential()
client = SecretClient(vault_url=KVUri, credential=credential)

# Get secrets from keyvault "MixitKeyVaultWebapp" for acces to servicebus.

# The first variable gets que string, the second variable sets que name.
sendsmsque = client.get_secret("sendsmsque")
sendsmsquename = "smsrequestqueue"

sendque = client.get_secret("sendque")
sendquename = "input-queue"

requestque = client.get_secret("requestque")
requestquename = "output-queue"
```

Courses I completed.

Learning Paths   Modules, Courses & More

TROPHY
Microsoft Azure Fundamentals: Describe Microsoft Cost Management and service level agreements
Completed on 3/14/2022

TROPHY
Microsoft Azure Fundamentals: Describe core solutions and management tools on Azure
Completed on 3/14/2022

TROPHY
Get started with Azure DevOps
Completed on 3/14/2022

TROPHY
Microsoft Azure Fundamentals: Describe core Azure services
Completed on 3/2/2022

TROPHY
Microsoft Azure Fundamentals: Describe core Azure concepts
Completed on 2/16/2022

Learning Paths   Modules, Courses & More

BADGE
Build your first Bicep template
Completed on 5/29/2022

BADGE
Implement message-based communication workflows with Azure Service Bus
Completed on 4/25/2022

BADGE
Introduction to Azure Logic Apps
Completed on 4/14/2022

BADGE
Run quality tests in your build pipeline by using Azure Pipelines
Completed on 4/12/2022

BADGE
Choose the right Azure services by examining SLAs and service lifecycle
Completed on 3/14/2022

BADGE
Plan and manage your Azure costs
Completed on 3/14/2022

BADGE
Build a cloud governance strategy on Azure
Completed on 3/14/2022

BADGE
Secure access to your applications by using Azure identity services
Completed on 3/14/2022

BADGE
Protect against security threats on Azure
Completed on 3/14/2022

BADGE
Choose the best monitoring service for visibility, insight, and outage mitigation
Completed on 3/14/2022

BADGE
Choose the best tools for managing and configuring your Azure environment
Completed on 3/14/2022

BADGE
Choose the best tools to help organizations build better solutions
Completed on 3/14/2022

BADGE

Choose the best Azure serverless technology for your business scenario

Completed on 3/14/2022

BADGE

Choose the best AI service for your needs

Completed on 3/14/2022

BADGE

Choose the best Azure IoT service for your application

Completed on 3/14/2022

BADGE

**Manage Agile software delivery plans across teams**

Completed on 3/14/2022

BADGE

Choose an Agile approach to software development

Completed on 3/14/2022

BADGE

Introduction to Azure DevOps

Completed on 3/14/2022

BADGE

Implement a code workflow in your build pipeline by using Git and GitHub

Completed on 3/14/2022

BADGE

Create a build pipeline with Azure Pipelines

Completed on 3/13/2022

BADGE

Assess your existing software development process

Completed on 3/10/2022

BADGE

Introduction to DevOps

Completed on 3/10/2022

BADGE

Explore Azure Storage services

Completed on 3/2/2022

BADGE

Explore Azure networking services

Completed on 3/2/2022

BADGE

Explore Azure database and analytics services

Completed on 3/1/2022

BADGE

Explore Azure compute services

Completed on 2/28/2022

BADGE

Describe core Azure architectural components

Completed on 2/16/2022

BADGE

Discuss Azure fundamental concepts

Completed on 2/16/2022

BADGE

Introduction to Azure fundamentals

Completed on 2/15/2022