Tests & Quizzes

Final exam

Return to Assessment List

Part 1 of 1 - 57.0 / 100.0 Points

Question 1 of 9 4.0 10.0 Points

[10 minutes]

Circle all statements that are true

- ✖ ☐ A. Suppose we need to apply load balancing for the API gateway. Client side load balancing is then the best option.
- ☐ B. Suppose we need to apply load balancing for the API gateway. Server side load balancing is then the best option.
- ☐ C. Suppose we have a microservice architecture and we need to apply load balancing for one of the microserices. Client side load balancing is then the best option.
- ✖ ☐ D. Suppose we have a microservice architecture and we need to apply load balancing for one of the microserices. Server side load balancing is then the best option.
- ✖ ☐ E. One reason why kafka uses event sourcing is that it allows producers to load balance the messages send to kafka
- ✖ ☐ F. A microservice architecture is always the best architectural style to use
- ✔ ☐ G. With JWT tokes, the user role is included in the token
- ☐ H. In a stream based architecture you always should use CQRS.
- ✔ ☐ I. We can implement the blackboard architectural style using kafka
- ✖ ☐ J. With the saga pattern we can implement strict consistency between microservices

Answer Key: B, C, G, I

Question 2 of 9 5.0 10.0 Points

[15 minutes]

A microservice architecture has many advantages, but also disadvantages. Suppose you are the architect of a large application build with many microservices

a. One problem of a microservice architecture is to make the whole system secure.
What technique(s) would you use to solve this problem?

b. One problem of a microservice architecture is to make the whole system resilient to failure.
What technique(s) would you use to solve this problem?

c. One problem of a microservice architecture is that it is difficult to get a good overview of the status of the business processes that are executed in the different microservices.
What technique(s) would you use to solve this problem?

d. One problem of a microservice architecture is that it is difficult to make a collection of actions that execute in different microservices in a transactional way. So I want to update data in different microservices within a transaction.
What technique(s) would you use to solve this problem?

A. We secure API Gateway with JTW for the token and OAuth2 for the authantication
b. We use Hystrix to solve this problem
c. we use Eureka for the registration of the service
d. We correct the logging in one place by using ELK stack or we publish those logs to kafka

Question 3 of 9 4.0 10.0 Points

[15 minutes]

Suppose you are responsible for designing and building Microservice A and Microservice B.
In System A you have to call system B in an **asynchronous** way.

a. We learned **2 completely different techniques/protocols** to implement an **asynchronous** call between Microservice A and Microservice B. Give the **name** of both **techniques/protocols**.

b. Clearly explain the architectural relevant **advantages and disadvantages** of both techniques /protocols given in part a. Explain clearly when you would use which techniques/protocols.

a. Two techniques are Publish-subscribe and event sourcing
b. Event sourcing:
Adv. storing all events increase the analytical capability of the business, we store the events that leadup in states, event are immutable and in event we don't miss anything,

Disadv. High memory usage, it is complex and it takes long for the boottime

Publish-subscribe

adv. Parallel async processing, manage workflow, log to multiple system and use fanout for replication and application alerts

Des. the publisher doesn't know the status of the system listening to the messages

Question 4 of 9 13.0 20.0 Points

[20 minutes]

We have an existing hotel booking system that offers generic hotel booking functionality like :
- Search hotels on keyword(s) like city, price, etc.
- View hotel details
- Book a hotel room
- Manage hotels (add new hotel, update hotel details, remove hotel, etc.)
- Etc.

a. You are the responsible architect for this system, and one of your colleagues advices to modify the existing system and apply the **CQRS** pattern for this system. Give **2 valid reasons** when it is a good idea to apply the CQRS pattern for this system. (**Be careful, only give valid reasons. If you give one or more reasons that are not valid you will lose some points**)

b. In the existing hotel booking system we have many different domain classes.
If we apply the CQRS pattern for this system, explain clearly what would change in the existing domain classes. In other words, how will the new domain classes differ from the old domain classes?

a. The two reasons are
1. we can apply the CQRS pattern for supporting the complex views and reporting
2. is in the results, single model that is full of componets

b. we use the domain model fo the command and view model for the queries we can even have 2services instead of 1

Question 5 of 9 8.0 15.0 Points

[15 minutes]

Suppose you have an existing application that contains about 10 components. You need to implement the logic of one business process that executes logic in 6 different components.
An example business process would be that a customer purchases a flight at an airline. In the customer component we have to add the customer. In the flight component we have to reserve the seat for the particular flight. In the meals component we have to add the meal for this customer. In the rewards component we have to add the rewards points for this flight.

You have 2 options for implementing the logic of this business process:
Option 1: You create a separate component that contains the overall business process itself, and this separate component will call the other 6 components to perform the necessary logic.

Option 2: You divide the overall business process in smaller parts, and implement these smaller parts in the existing 6 different components.

a. What are the advantages and disadvantages of option 1 and option 2?

b. Your boss asks you for your advice. Explain clearly when you would choose option 1 and when you would choose option 2.

Option 1
Advantages:

everything is implemented in one large system, We use one one programming lanugage

and single development stack

Disadvantages:

This can evolve in big ball of mud, this doesn't support small agile , in deploying it's very slow and take a lot of ceremony. and the option 1 has single development stack

Option 2:

Advantage: Simple and lightweight, decoupled and independent programing language

and runs in independent process, Easely in scrum and devops

Disadvantage:

In microservice there is a high chance of failure while service are being communicating ,

and it's very difficult to manage more components or service. we need to solve the problem of load balancing

Question 6 of 9 4.0 10.0 Points

[10 minutes]

Suppose we have a system that contains many microservices. Now we need to write a client web application in Angular that shows data that comes from these different microservices.
Give **3 valid reasons** why it is not a good idea to have this client web application talk directly to the different microservices.
(Be careful, only give valid reasons. If you give one or more reasons that are not valid you will lose some points)

1. We have to authenticate the request and authorized it if it passes the authentication and know you are who you said you are

2. It's not a good idea to connect it directly to the miscroservice because the data can be expose to the public
3. We have to create routers and service in order to the UI to be connected to the backend (Microservices)

Question 7 of 9 8.0 10.0 Points

[10 minutes]

In this course we learned that the registry uses a heartbeat to check if a service is still up and running. Suppose serviceA instance1 is down and serviceA instance2 is up and running, and serviceB wants to call serviceA. ServiceB will call the registry, and gets the address of serviceA instance2 because the registry knows that serviceA instance1 is down.

If we also add load balancing to these calls between serviceA and serviceB we basically have failover. If a service fails then the registry knows about it, and that service will not be used till it gets up and running again. If the registry and load balancing give us already failover, why do we need hystrix? In other words, what does hystrix provide that we don't get already with the registry and load balancing?

We need hystrix in microservice architecture to enable resilient in complex distrubuted system and for the fallback where the failure is inevitable for the distributed calls

Question 8 of 9 6.0 10.0 Points

[15 minutes]

a. Explain clearly why in a microservice architecture typically does not make use of an ESB.

b. Explain clearly why every microservice uses its own database instance? Why don't they share the same database?

the microservice doesn't use ESB because ESB slows the system, and ESB is for connecting monolithic system applications

Every microservice uses its own database because it can use the type of the database suits the needs of the organization, we use different database for the lousily coupled and changes of one service database doesn't affect the other's

Question 9 of 9 5.0 5.0 Points

[10 minutes]

Describe how we can relate a **stream based architecture** to one or more principles of SCI. Your answer should be about 2 to 3 paragraphs. The number of points you get for this questions depends how well you explain the relationship between a **stream based architecture** and one or more principles of SCI.

Stream based architecture handles the data when it arrives I can related this with SCI in one of SCI principles the nature of life is to grow, here where we meditate and reach the unfield filed we become aware of our inner, the consiciuouness became pure and we fruit our life from meditation where we gain energy and sharp our minds

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