S90.09$^{Q\&As}$

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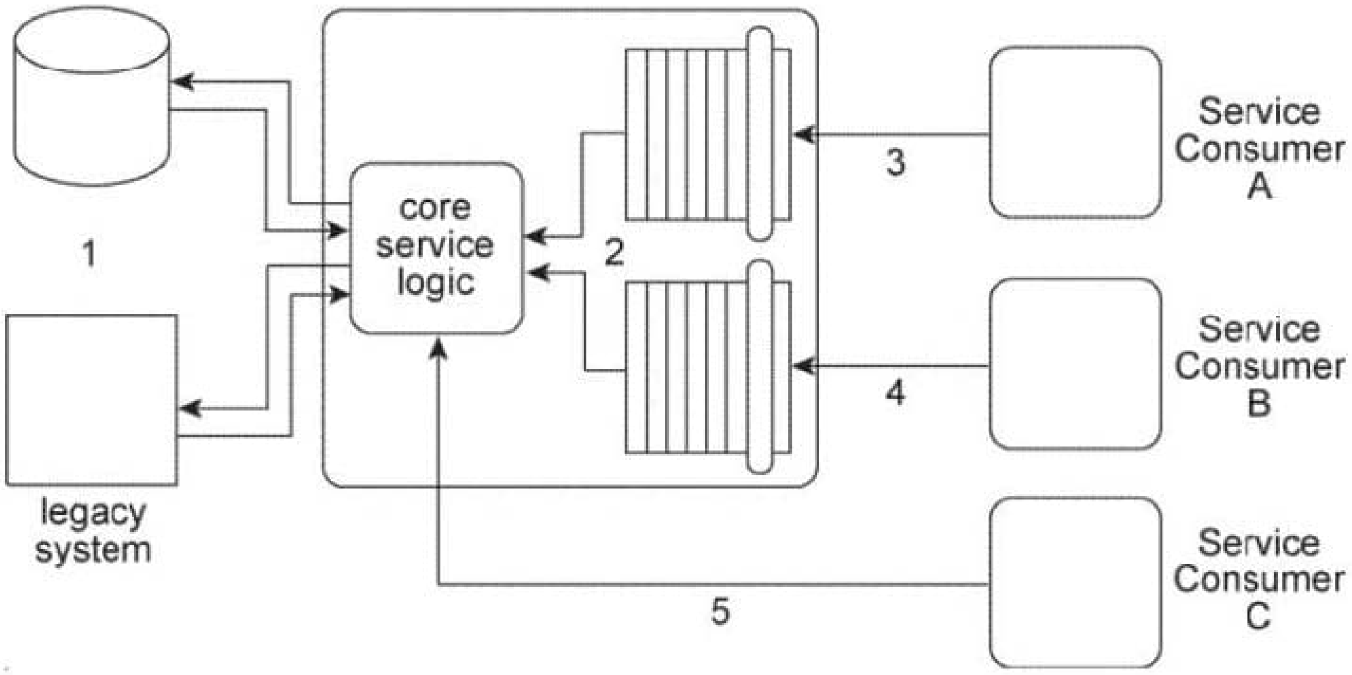
QUESTION 1

The architecture for Service A displayed in the Figure shows how the core logic of Service A has expanded over time to connect to a database and a proprietary legacy system (1) and to support two separate service contracts (2) that are accessed by different service consumers.

The service contracts are fully decoupled from the service logic. The service logic is therefore coupled to the service contracts and to the underlying implementation resources (the database and the legacy system).

Service A currently has three service consumers. Service Consumer A and Service Consumer B access Service A\\'s two service contracts (3, 4). Service Consumer C bypasses the service contracts and accesses the service logic directly (5).



You are told that the database and legacy system that are currently being used by Service A are being replaced with different products. The two service contracts are completely decoupled from the core service logic, but there is still a concern that the introduction of the new products will cause the core service logic to behave differently than before. What steps can be taken to change the Service A architecture in preparation for the introduction of the new products so that the impact on Service Consumers A, B, and C is minimized?

A. The Service Abstraction principle can be applied to hide the implementation details from the core service logic of Service A, thereby shielding this logic from changes to the implementation. In support of this, the Service Facade pattern can be applied to position Facade components between the core service logic and Service Consumers A and B. These Facade components will be designed to regulate the behavior of Service A . The Contract Centralization pattern can be applied to force Service Consumer C to access Service A via one of its existing service contracts.

B. A third service contract can be added together with the application of the Contract Centralization pattern. This will force Service Consumer C to access Service A via the new service contract. The Service Facade pattern can be applied to position a Facade component between the new service contract and Service Consumer C in order to regulate the behavior of Service A . The Service Abstraction principle can be applied to hide the implementation details of Service A so that no future service consumers are designed to access any of Service A\\'s underlying resources directly.

C. The Service Facade pattern can be applied to position Facade components between the core service logic and the two service contracts. These Facade components will be designed to regulate the behavior of Service A . The Contract Centralization pattern can also be applied to force Service Consumer C to access Service A via one of its existing service contracts.

D. None of the above.

Correct Answer: C

QUESTION 2

Currently, due to the increasing amount of concurrent access by service consumers, the runtime performance of both the Client and Vendor services has worsened and has therefore reduced their effectiveness as service composition members. Additionally, a review of the logic of both services has revealed that some of the business rules used by the Client and Vendor services are actually the same. What steps can be taken to improve performance and reduce redundant business rule logic?

A. The Rules Centralization pattern can be applied by extracting the business rule logic from the Client and Vendor services and placing it into a new Rules service, thereby reducing the redundancy of business rules logic. The Redundant Implementation pattern can then be applied to establish a scalable Rules service that is capable of supporting concurrent access from many service consumers.

B. The Redundant Implementation pattern can be applied to the Client and Vendor services, thereby establishing duplicate service implementations that can be accessed when a service reaches its runtime usage threshold. The Intermediate Routing pattern can be further applied to provide load balancing logic that can, at runtime, determine which of the redundant service implementations is the least busy for a given service consumer request.

C. The Rules Centralization pattern can be applied to isolate business rules logic into a central and reusable Rules service. Additionally, the Service Abstraction principle can be applied to hide the implementation details of new the Rules service.

D. None of the above.

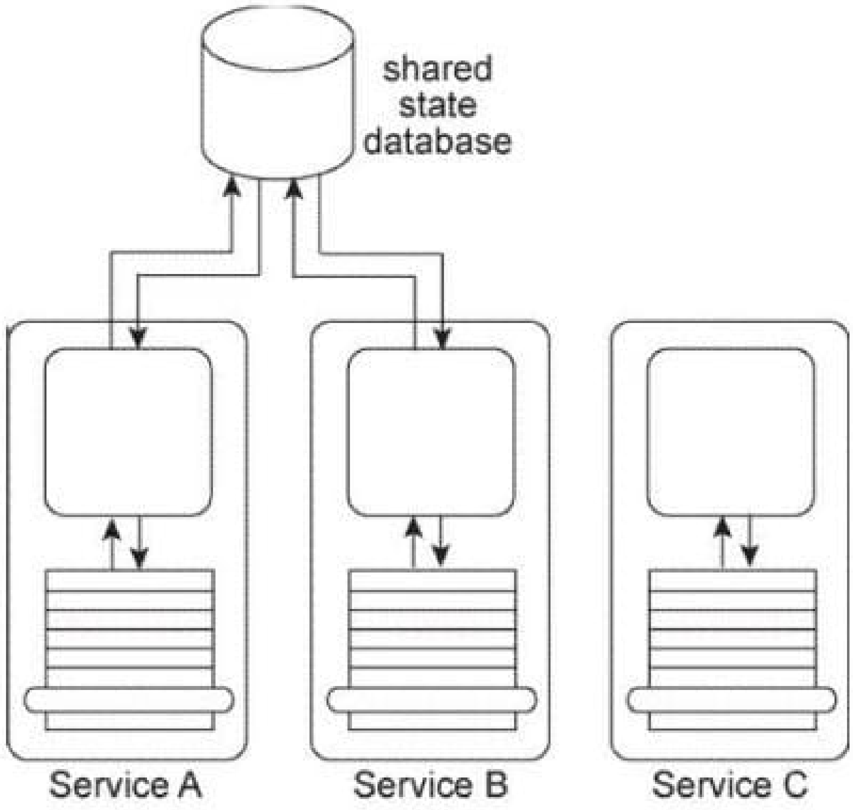
Correct Answer: A

QUESTION 3

Services A, B, and C are non-agnostic task services. Service A and Service B use the same shared state database to defer their state data at runtime.

An assessment of these three services reveals that each contains some agnostic logic, but because it is bundled together with the non-agnostic logic, the agnostic logic cannot be made available for reuse.

The assessment also determines that because Service A and Service B and the shared state database are each located in physically separate environments, the remote communication required for Service A and Service B to interact with the shared state database is causing an unreasonable decrease in runtime performance.



You are asked to redesign this architecture in order to increase the opportunity for agnostic service logic to be reused and in order to decrease the runtime processing demands so that performance can be improved. What steps can be taken to achieve these goals?

A. The Enterprise Service Bus pattern can be applied to establish an environment whereby the Process Abstraction and Process Centralization patterns are naturally applied, resulting in a clean separation of non-agnostic task services from newly designed agnostic services that are further shaped into reusable services by the application of the Service Reusability principle.

B. The Process Centralization pattern can be applied, resulting in a redesign effort where agnostic logic is removed from the three task services so that they only encapsulate non- agnostic logic. The agnostic logic is then moved to one or more new agnostic services that are shaped into reusable services by the application of the Service Reusability principle. The Process Abstraction pattern is then applied to the redesigned task services Service A and Service B, so that their logic is physically centralized, turning them into orchestrated task services.

C. The Process Abstraction pattern can be applied, resulting in a redesign effort where agnostic logic is removed from the three task services so that they only encapsulate non- agnostic logic. The agnostic logic is then moved to one or more new agnostic services that are shaped into reusable services by the application of the Service Reusability principle. The Orchestration pattern can be further applied to establish an environment whereby the Process Centralization pattern is naturally applied to Services A and B and the State Repository pattern in naturally applied to further help avoid remote communication by providing a local and centralized state database that can be shared by both services.

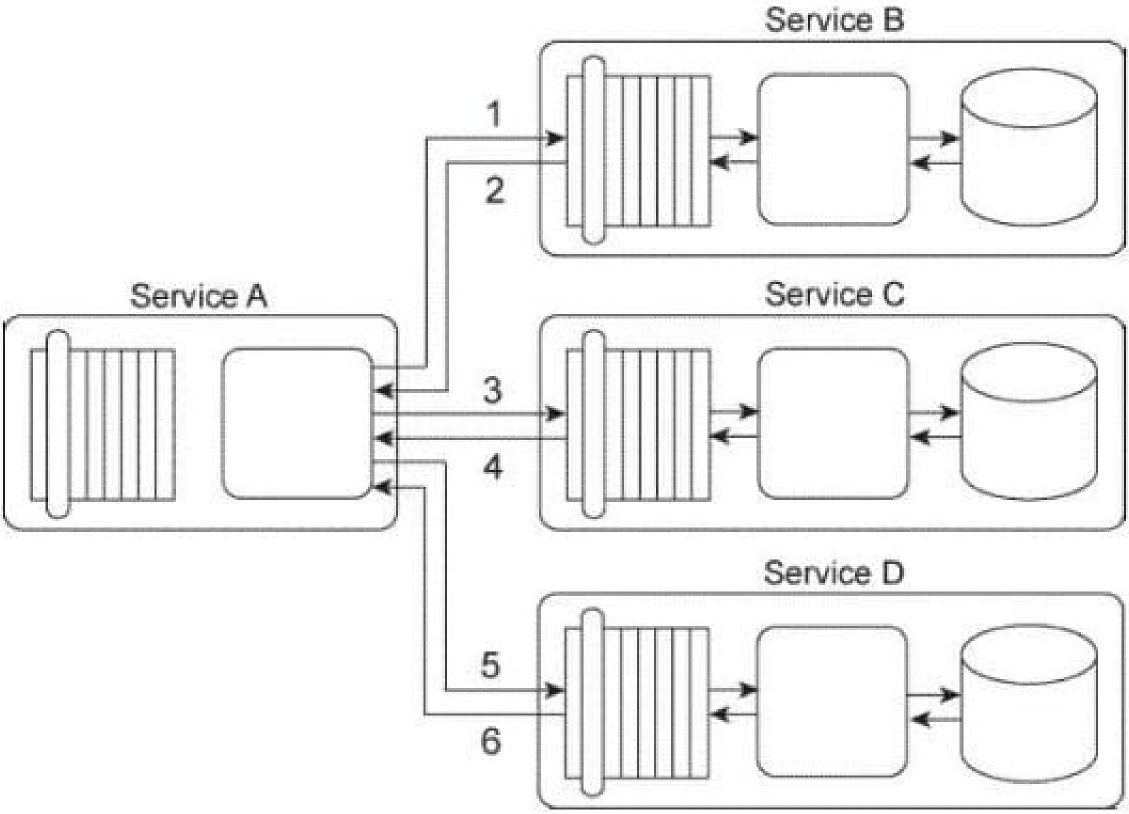
D. None of the above.

Correct Answer: C

QUESTION 4

Service A is a task service that is required to carry out a series of updates to a set of databases in order to complete a task. To perform the database updates Service A must interact with three other services, each of which provides standardized data access capabilities.

Service A sends its first update request message to Service B (1), which then responds with a message containing a success or failure code (2). Service A then sends its second update request message to Service C (3), which also responds with a message containing a success or failure code (4). Finally, Service A sends a request message to Service D (5), which responds with its own message containing a success or failure code (6).



You\\'ve been given a requirement that all database updates must either be completed successfully or not at all. This means that if any of the three response messages received by Service A contain a failure code, all of the updates carried out until that point must be reversed. Note that if Service A does not receive a response message back from Services B, C, or D, it must assume that a failure has occurred. How can this service composition architecture be changed to fulfill these requirements?

A. The Reliable Messaging pattern can be applied to guarantee the delivery of positive or negative acknowledgements. This way, Service A will always be informed of whether a failure condition has occurred with any of the database updates performed by Services B, C, and D. Furthermore, the Service Loose Coupling principle can be applied to ensure that the request and response messages exchanged by the services do not contain any implementation details that would indirectly couple Service A to any of the databases.

B. The Atomic Service Transaction pattern can be applied individually to Services B, C, and D so that each of these services performs its own database update within the scope of an atomic transaction. If anyone update fails, that change can be rolled back on that database. Furthermore, the Service Loose Coupling principle can be applied to ensure that Service A is kept out of the scope of the atomic transaction so that it is not negatively coupled to the proprietary database technologies that are required to enable the atomic transaction functionality.

C. The Compensating Service Transaction can be applied to Service A so that when any one response message containing a failure code is received by Service A, it can invoke exception handling logic that will log the failed database updates. The Service Loose Coupling principle can be further applied to ensure that Services B, C, or D are not indirectly coupled to the exception handling logic, especially if Service A requires additional access to Services B, C, or D in order to collect more information for logging purposes.

D. None of the above.

Correct Answer: D

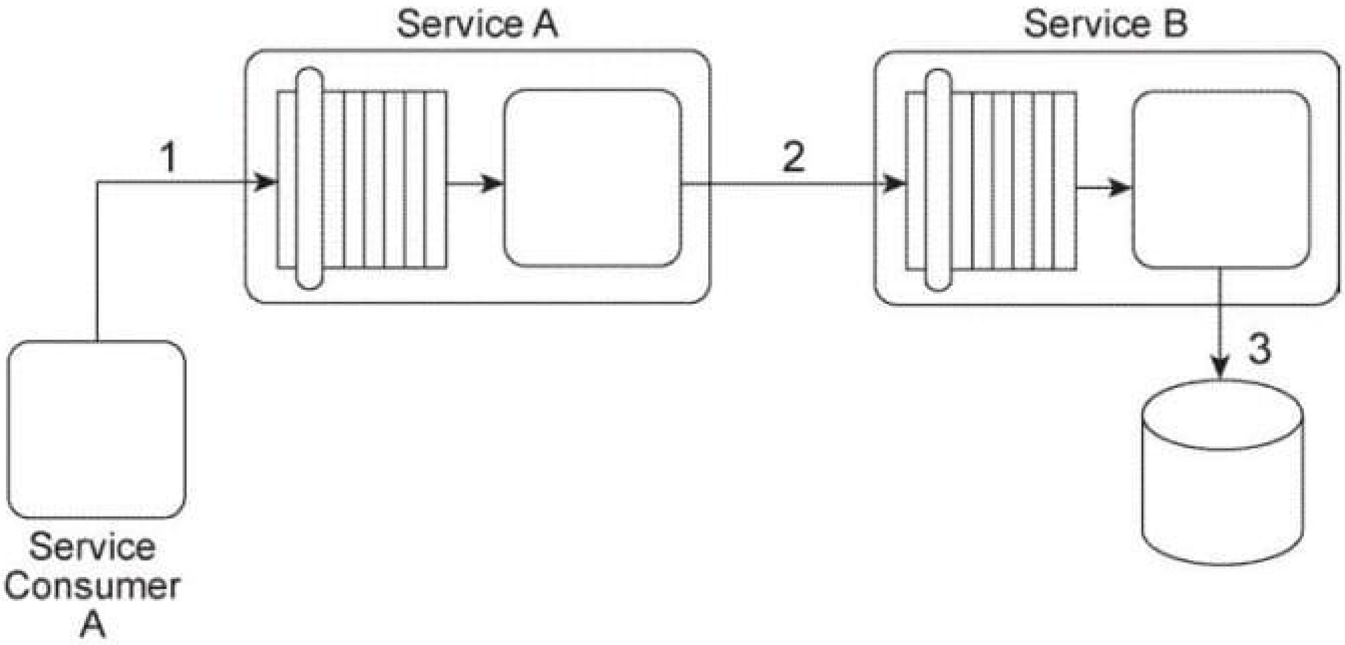
QUESTION 5

Service A is an entity service with a functional context dedicated to invoice-related processing. Service B is a utility service that provides generic data access to a database.

In this service composition architecture, Service Consumer A sends a SOAP message containing an invoice XML document to Service A(1). Service A then sends the invoice XML document to Service B (2), which then writes the invoice document to a database.

The data model used by Service Consumer A to represent the invoice document is based on XML Schema

A. The service contract of Service A is designed to accept invoice documents based on XML Schema B. The service contract for Service B is designed to accept invoice documents based on XML Schema A. The database to which Service B needs to write the invoice record only accepts entire business documents in Comma Separated Value (CSV) format.



Due to the incompatibility of XML schemas used by the services, the sending of the invoice document from Service Consumer A through to Service B cannot be accomplished using the services as they currently exist. Assuming that the Contract Centralization and Logic Centralization patterns are being applied, what steps can be taken to enable the sending of the invoice document from Service Consumer A to the database without adding logic that will increase the runtime performance of the service composition?

A. The Data Model Transformation pattern can be applied so that the invoice document sent by Service Consumer A is transformed into an invoice document that is compliant with the XML Schema B used by Service A . The Data Model Transformation pattern can be applied again to ensure that the invoice document sent by Service A is compliant with

XML Schema A used by Service B.

B. The service composition can be redesigned so that Service Consumer A sends the invoice document directly to Service B. Because Service Consumer A and Service B use XML Schema A, the need for transformation logic is avoided. This naturally applies the Service Loose Coupling principle because Service Consumer A is not required to send the invoice document in a format that is compliant with the database used by Service B.

C. The Standardized Service Contract principle can be applied to the service contract of Service A so that it is redesigned to use XML Schema A. This would make it capable of receiving the invoice document from Service Consumer A and sending the invoice document to Service B without the need to further apply the Data Model Transformation pattern.

D. None of the above.

Correct Answer: C