Assignment 4: Well Architected Framework for creating Non-functional requirements for the e-commerce company

Assignment: As a Cloud Architect for an e-commerce company, you have been tasked with creating a set of non-functional requirements for the company's e-commerce platform. Using the Well Architected Framework, create a list of non-functional requirements that will help ensure the platform is secure, reliable, efficient, and scalable.

## Questions to ask:

1. What are the critical components of the e-commerce platform?
2. What are the performance expectations of the platform?
3. What are the security requirements of the platform?
4. What are the availability requirements of the platform?
5. What are the compliance requirements of the platform?

## Checklist:

1. Security: Identify the security requirements of the platform, including authentication, authorization, encryption, and access control. Ensure that the platform complies with industry-standard security frameworks, such as PCI-DSS and ISO 27001.
2. Reliability: Identify the reliability requirements of the platform, including fault tolerance, high availability, and disaster recovery. Ensure that the platform has a robust backup and recovery strategy in place.
3. Performance: Identify the performance requirements of the platform, including response time, throughput, and latency. Ensure that the platform can handle peak loads and scale to meet the demands of the business.
4. Scalability: Identify the scalability requirements of the platform, including horizontal and vertical scalability, and the ability to handle increasing volumes of data and traffic. Ensure that the platform can be scaled up or down as needed.
5. Compliance: Identify the compliance requirements of the platform, including data privacy regulations, such as GDPR and CCPA, and industry-specific regulations, such as HIPAA and FINRA. Ensure that the platform complies with all relevant regulations.

## Considerations:

As a Cloud Architect, the non-functional requirements for an e-commerce platform may include the following:

1. Security: The platform should have strong encryption and access control mechanisms to protect customer data. It should comply with industry-standard security frameworks, such as PCI-DSS and ISO 27001.
2. Reliability: The platform should be fault-tolerant and have a robust backup and recovery strategy in place to ensure high availability and disaster recovery.
3. Performance: The platform should be able to handle peak loads and scale to meet the demands of the business. Response time, throughput, and latency should meet or exceed industry benchmarks.
4. Scalability: The platform should be scalable, both horizontally and vertically, and able to handle increasing volumes of data and traffic. It should be able to scale up or down as needed.
5. Compliance: The platform should comply with data privacy regulations, such as GDPR and CCPA, as well as industry-specific regulations, such as HIPAA and FINRA.

By considering these non-functional requirements, the e-commerce platform can be designed to meet the needs of the business while also ensuring that it is secure, reliable, efficient, and scalable.

Questions

* What are the performance requirements?
  + How quickly should pages load?
  + What is the maximum response time for requests?
  + How many concurrent users should the system support?
  + What is the acceptable error rate?
  + How many transactions should the system support per second?
* What are the availability requirements?
  + What is the expected uptime for the system?
  + What is the maximum allowable downtime?
  + What is the disaster recovery plan?
* What are the scalability requirements?
  + How easily can the system scale horizontally?
  + What is the maximum number of instances the system can run?
  + What is the maximum capacity of the system?
* What are the security requirements?
  + What are the authentication and authorization mechanisms?
  + What are the data security requirements?
  + What are the compliance requirements?
* What are the maintainability requirements?
  + How easily can the system be maintained?
  + How easily can the system be updated?
  + How easily can the system be scaled up or down?

## Checklist:

1. Document the performance requirements, including response times, error rates, and transaction volumes.
2. Specify the availability requirements, including uptime, maximum downtime, and disaster recovery plan.
3. Define the scalability requirements, including horizontal scalability, maximum number of instances, and maximum capacity.
4. Define the security requirements, including authentication, authorization, data security, and compliance requirements.
5. Specify the maintainability requirements, including maintenance, updates, and scaling.

## E-commerce Company: Zomazon

Non-Functional Requirements Checklist:

1. Performance: The application must be able to handle at least 5000 concurrent users during peak times with a response time of under 2 seconds.
2. Availability: The application must have a minimum uptime of 99.99% in a year.
3. Security: The application must ensure that sensitive customer data such as personal information and payment details are encrypted and protected at all times.
4. Scalability: The application must be able to scale up or down quickly and easily based on changing traffic and usage patterns.
5. Reliability: The application must be able to recover from failures without impacting the end user experience.
6. Maintainability: The application must be easy to maintain and update, with minimal downtime or impact on users.
7. Usability: The application must be intuitive and user-friendly, with clear navigation and easy-to-use features.
8. Compliance: The application must adhere to all relevant regulatory and compliance standards, including GDPR, PCI-DSS, and others.

For example, for performance, the non-functional requirement could be that the website must be able to handle at least 5000 concurrent users during peak times, with a response time of under 2 seconds. To achieve this, the architecture must be designed in a way that allows for horizontal scaling, caching, and other performance optimizations. Additionally, load testing and performance monitoring should be implemented to ensure that the application meets these requirements.

## Steps to identify Non-functional requirements:

To create non-functional requirements for an e-commerce company, the following steps could be taken:

1. Identify the critical areas of the e-commerce platform: The first step is to identify the most critical areas of the platform that require non-functional requirements. This could include the checkout process, product search functionality, user authentication, and payment processing.
2. Define the performance and scalability requirements: For each critical area identified in step 1, the performance and scalability requirements need to be defined. This could include response times for page loads, transaction processing times, and the ability to handle a certain number of concurrent users.
3. Determine the availability requirements: The availability requirements for the e-commerce platform should also be defined. This could include the percentage of uptime required and the expected time to restore service in the event of an outage.
4. Specify security and compliance requirements: The security and compliance requirements should also be defined. This could include requirements around data encryption, access control, and compliance with regulatory frameworks such as PCI DSS.
5. Define the maintainability and supportability requirements: The maintainability and supportability requirements should also be defined. This could include requirements around logging and monitoring, error handling, and the ability to quickly and easily deploy new features or bug fixes.
6. Specify the usability and accessibility requirements: Finally, the usability and accessibility requirements should be defined. This could include requirements around the user interface, accessibility for users with disabilities, and the ability to support multiple languages and currencies.

## Example:

For an e-commerce company, the non-functional requirements could be:

1. **Critical areas: checkout process, product search functionality, user authentication, and payment processing.**
2. **Performance and scalability requirements: Page load times should be less than 2 seconds, transaction processing times should be less than 5 seconds, and the platform should be able to handle at least 10,000 concurrent users.**
3. **Availability requirements: The platform should have at least 99.9% uptime, and the expected time to restore service in the event of an outage should be less than 30 minutes.**
4. **Security and compliance requirements: All user data should be encrypted at rest and in transit, access control should be implemented, and the platform should comply with PCI DSS regulations.**
5. **Maintainability and supportability requirements: Logging and monitoring should be implemented, error handling should be robust, and the platform should be able to deploy new features or bug fixes within a day.**
6. **Usability and accessibility requirements: The user interface should be intuitive and easy to use, accessibility for users with disabilities should be implemented, and the platform should support at least five languages and currencies.**

The non-functional requirements for the e-commerce platform should be regularly reviewed and updated to ensure they continue to meet the changing needs of the business and its customers.