2. Secured and monitored web infrastructure

Infrastructure Design:

Additional Elements and Reasons:

1. Three-tier Firewall Configuration:

Reason: Enhanced security through strict control over incoming and outgoing traffic, bolstering defense against unauthorized access and potential threats.

2. Implementation of SSL Certificate for HTTPS:

Reason: Encryption of data transmission between clients and servers to ensure confidentiality and integrity, particularly vital for safeguarding sensitive information.

3. Deployment of Triple Monitoring Clients:

Reason: Active monitoring and collection of performance metrics, system health data, and early issue detection for proactive troubleshooting and maintenance.

Specifics About Each Element:

Firewalls:

Purpose: Control and filtration of network traffic to safeguard against unauthorized access and potential security threats.

SSL Certificate (HTTPS):

Purpose: Encryption of data transmissions to maintain confidentiality and integrity, especially crucial for securing sensitive transactions.

Monitoring:

Purpose: Active tracking of system performance metrics and early anomaly detection to ensure optimal resource utilization and preempt potential issues.

Monitoring Tool Data Collection:

Method: Utilization of monitoring tools such as Sumo Logic equipped with agents to gather metrics, logs, and events from servers actively.

Web Server QPS Monitoring:

Action: Implementation of monitoring tools to track Web Server QPS (Queries Per Second), analyze traffic patterns, and identify performance bottlenecks.

Issues with the Infrastructure:

SSL Termination at Load Balancer:

Issue: SSL termination at the load balancer may expose unencrypted traffic within the internal network, posing a security risk. SSL termination ideally should occur at the web servers.

Single MySQL Server for Writes:

Issue: Dependency on a single MySQL server for write operations introduces a Single Point of Failure (SPOF), risking data inconsistency or loss in the event of server failure.

Identical Components on All Servers:

Issue: Uniformity of components across servers may result in a lack of diversity and redundancy, leaving the entire infrastructure susceptible to simultaneous failures or widespread issues.