IntelliConsult

Software Engineering - (IT314)

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Non-Functional Testing

Non-functional testing for the **IntelliConsult Platform** focuses on evaluating system characteristics that are not directly linked to specific functionalities but are critical for ensuring superior performance, reliability, and user experience.

This testing examines aspects like responsiveness, scalability, **security**, usability, and adaptability under various conditions. By evaluating these non-functional aspects, the process strengthens the app's reliability and optimizes its capabilities to consistently meet or exceed user expectations, ensuring ease of use for users.

Non-Functional Requirements

1. **Performance:** The app must provide quick responses to user actions and ensure efficient data processing.
2. **Reliability:** Guarantee high uptime and data accuracy to prevent interruptions in **patient care and data management**.
3. **Scalability:** The app should seamlessly support an increasing number of users as its adoption grows.
4. **Usability:** The interface should be intuitive and simple, making it easy for all users to navigate and utilize its features effectively.
5. **Mobile Accessibility:** Ensure the app is optimized for smooth performance and usability on mobile devices.

Objectives

1. Non-Functional Testing enhances the configuration, implementation, oversight, and monitoring of the application.
2. It improves the app's usability, effectiveness, maintainability, and portability.
3. It ensures an enhanced and seamless user experience, making the app easy to use for all users.

Usability Testing

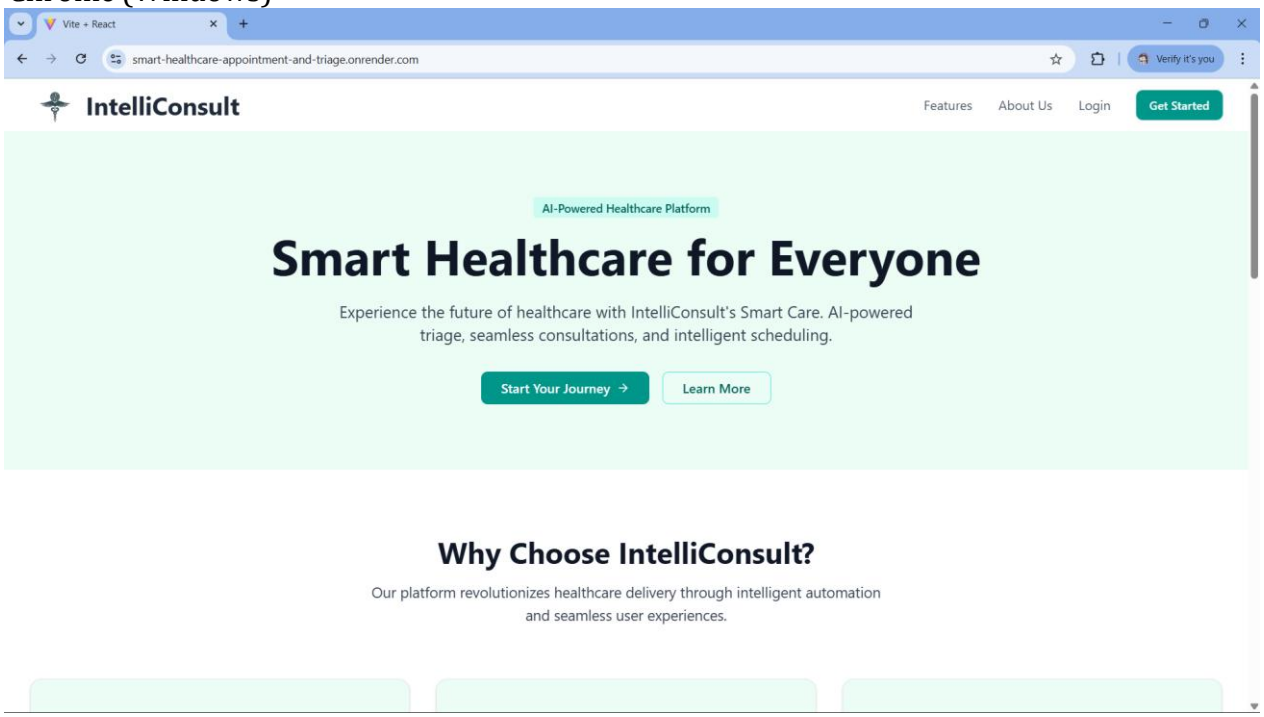
This testing evaluates how simple it is to use the app, focusing on its design and interface. It includes assessments of user experience, accessibility, and adaptability to different user needs.

As demonstrated through GUI and acceptance testing, **IntelliConsult** is highly user-friendly, thanks to its intuitive interface and thoughtful design.

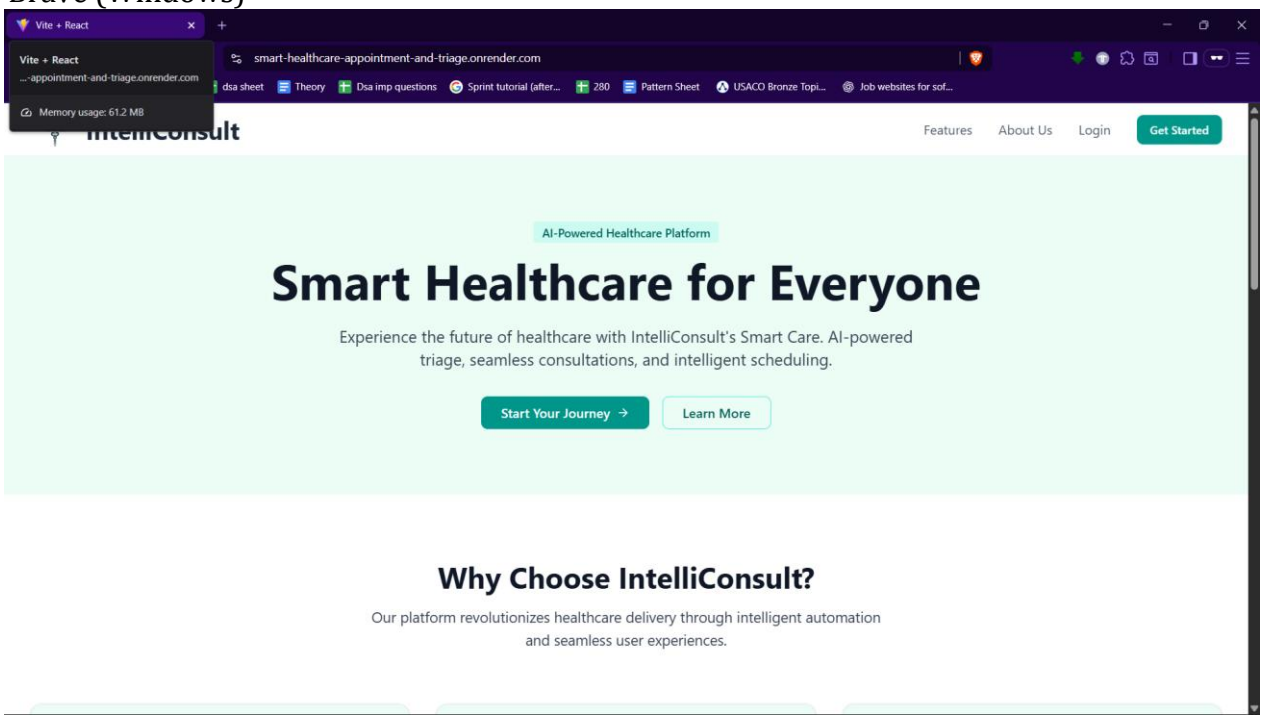
Compatibility Check

1. Compatibility Testing

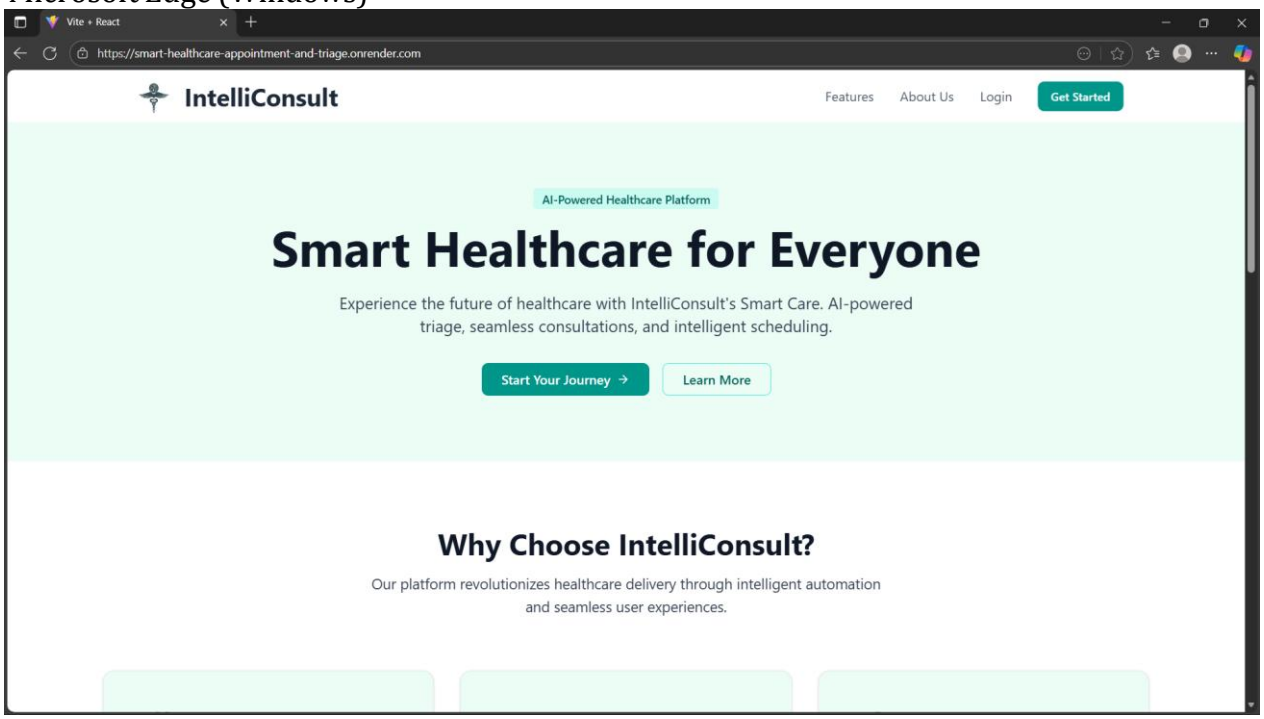
Chrome (Windows)



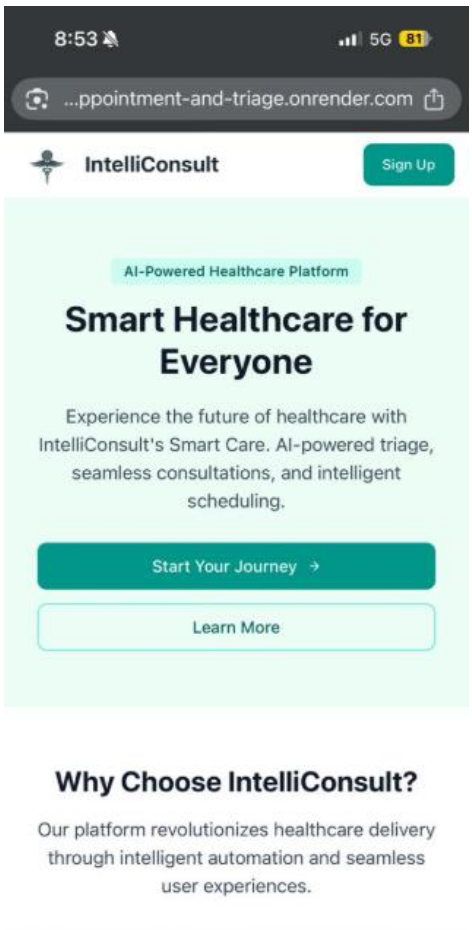
Brave (Windows)



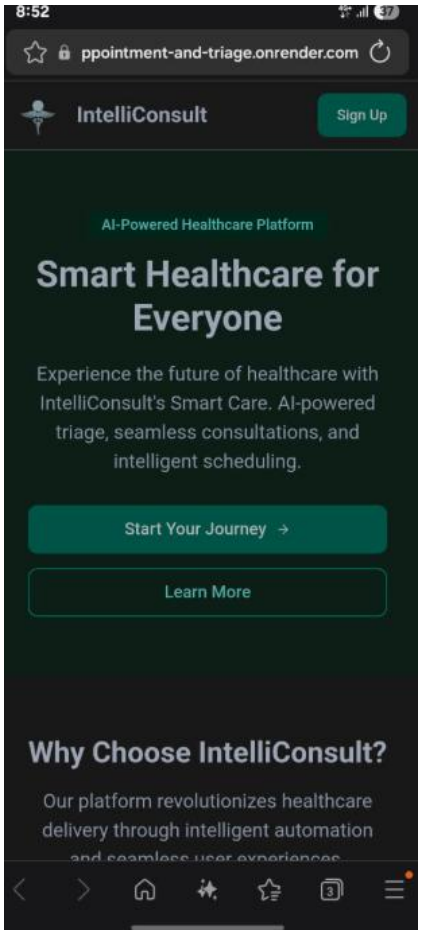
Microsoft Edge (Windows)



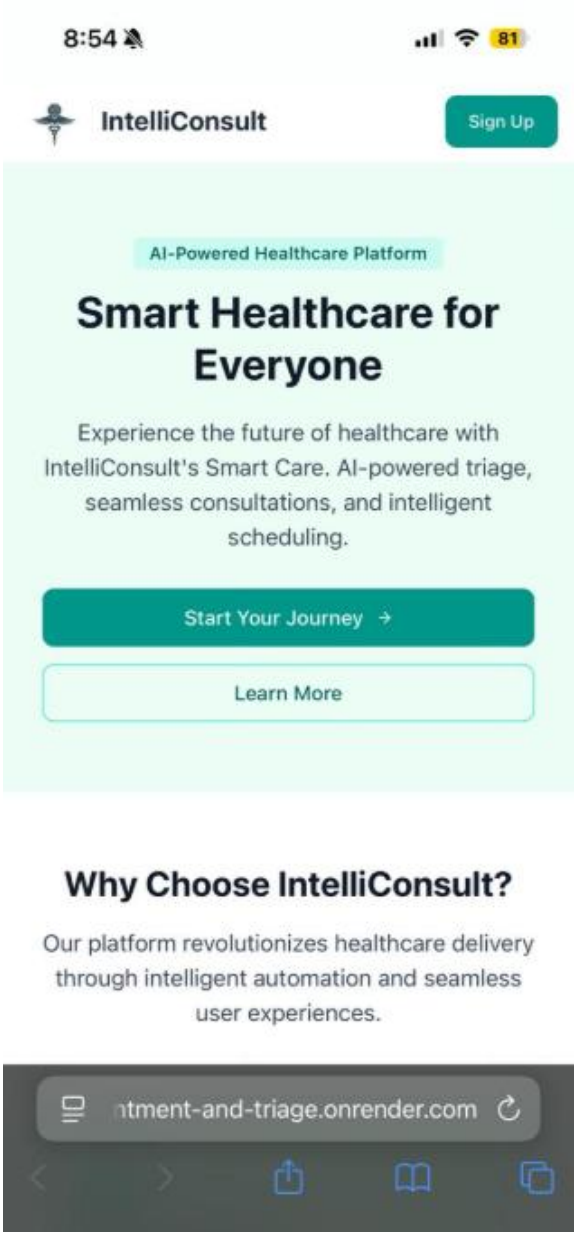
Chrome(iOS)



Chrome (Android)



Safari (iOS)


8:54
81
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Our platform revolutionizes healthcare delivery through intelligent automation and seamless user experiences.
ıtment-and-triage.onrender.com

Security Testing

Authentication and Authorization

Our system implements a robust, industry-standard authentication and authorization framework to manage user access. This framework ensures a secure and seamless experience through standard features like:

- **Secure Credential Handling:** Utilizing best practices for password hashing and storage.
- **Role-Based Access Control (RBAC):** Ensuring that only authorized users can access sensitive areas based on their defined role (e.g., clinician, patient, administrator).
- **Multi-Factor Authentication (MFA):** Available for an extra layer of security.

Only authenticated and authorized users can access sensitive areas of the platform, ensuring robust data protection.

Data Security

All sensitive user data, including credentials and session information, is protected using **strong encryption protocols**.

Our database is hosted on **MongoDB Atlas**, which provides enterprise-grade security features, ensuring that data is protected both at rest and in transit. This includes:

- **Encryption:** Automatic encryption for data storage.
- **Network Isolation:** Secure connections and firewall rules to restrict database access.
- **Granular Access Control:** Limiting read/write permissions to essential services only.

These measures safeguard user credentials and prevent unauthorized access at both the application and database layers.

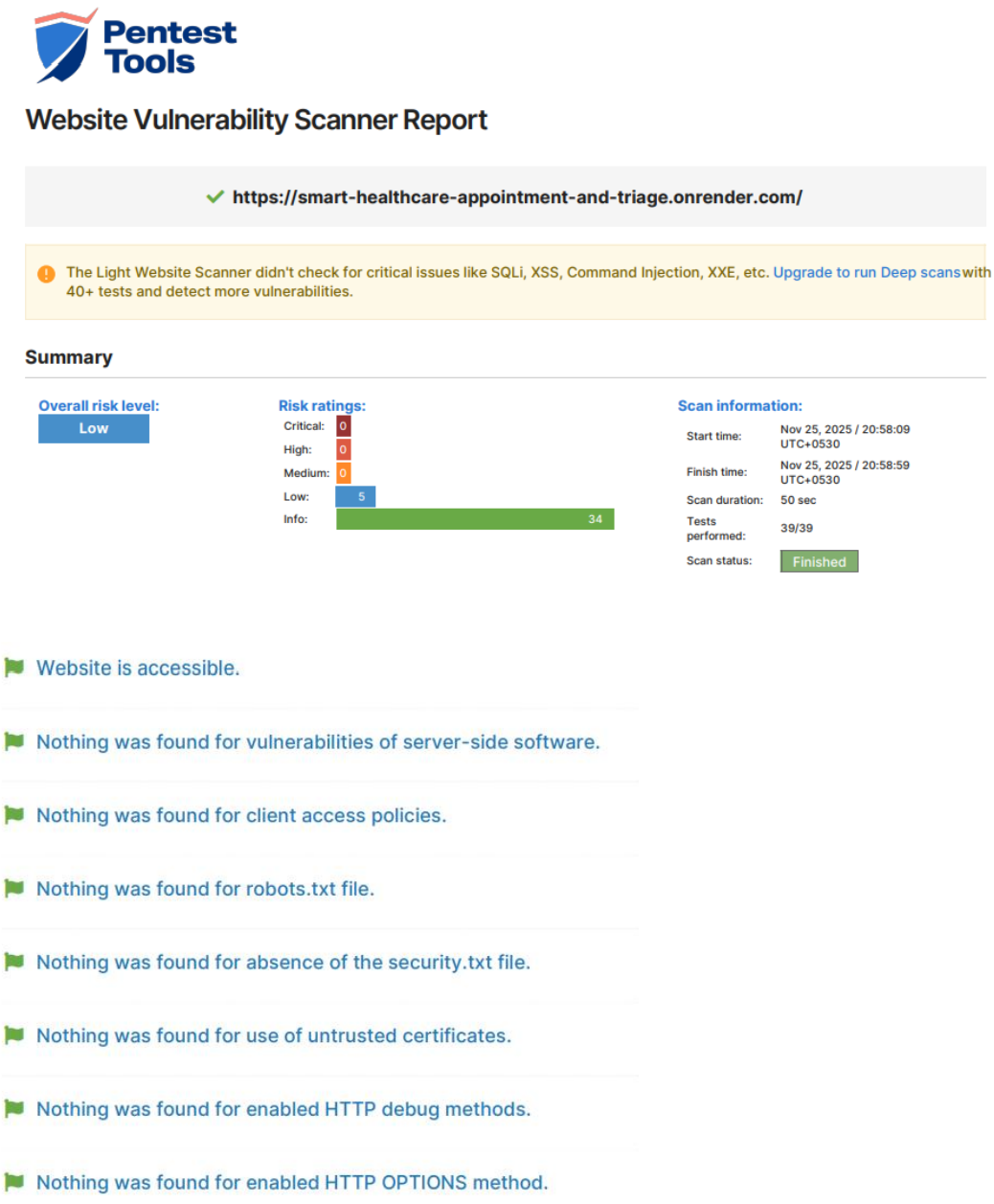
Session Management

Sessions are managed securely using **token-based mechanisms** with defined lifecycles and automatic refresh capabilities to ensure an uninterrupted, yet secure, user experience. Our framework handles secure session persistence and timely revocation to protect against session hijacking.

Security Testing

To ensure an additional layer of security, we perform external vulnerability assessments. We scanned our website using the third-party security tool, **https://pentest-tools.com/**,

to rigorously identify and promptly address potential vulnerabilities across the application, strengthening our defenses against common web exploits.



- Nothing was found for directory listing.
- Nothing was found for passwords submitted unencrypted.
- Nothing was found for error messages.
- Nothing was found for debug messages.
- Nothing was found for code comments.
- Nothing was found for passwords submitted in URLs.
- Nothing was found for domain too loose set for cookies.
- Nothing was found for mixed content between HTTP and HTTPS.
- Nothing was found for cross domain file inclusion.
- Nothing was found for internal error code.
- Nothing was found for HttpOnly flag of cookie.
- Nothing was found for Secure flag of cookie.

- Nothing was found for SQL statement in request parameter.
- Nothing was found for password returned in later response.
- Nothing was found for Path Disclosure.
- Nothing was found for Session Token in URL.
- Nothing was found for API endpoints.
- Nothing was found for emails.
- Nothing was found for missing HTTP header - Rate Limit.

Scan coverage information

List of tests performed (39/39)

- ✓ Test initial connection
- ✓ Scanned for missing HTTP header - Strict-Transport-Security
- ✓ Scanned for missing HTTP header - Referrer
- ✓ Scanned for missing HTTP header - Content Security Policy
- ✓ Scanned for missing HTTP header - X-Content-Type-Options
- ✓ Scanned for website technologies
- ✓ Scanned for version-based vulnerabilities of server-side software
- ✓ Scanned for client access policies
- ✓ Scanned for robots.txt file
- ✓ Scanned for absence of the security.txt file
- ✓ Scanned for use of untrusted certificates
- ✓ Scanned for enabled HTTP debug methods
- ✓ Scanned for enabled HTTP OPTIONS method
- ✓ Scanned for secure communication
- ✓ Scanned for directory listing
- ✓ Scanned for passwords submitted unencrypted
- ✓ Scanned for error messages
- ✓ Scanned for debug messages
- ✓ Scanned for code comments
- ✓ Scanned for passwords submitted in URLs
- ✓ Scanned for domain too loose set for cookies
- ✓ Scanned for mixed content between HTTP and HTTPS
- ✓ Scanned for cross domain file inclusion
- ✓ Scanned for internal error code
- ✓ Scanned for HttpOnly flag of cookie
- ✓ Scanned for Secure flag of cookie
- ✓ Scanned for login interfaces
- ✓ Scanned for secure password submission
- ✓ Scanned for sensitive data
- ✓ Scanned for unsafe HTTP header Content Security Policy
- ✓ Scanned for OpenAPI files
- ✓ Scanned for file upload
- ✓ Scanned for SQL statement in request parameter
- ✓ Scanned for password returned in later response
- ✓ Scanned for Path Disclosure
- ✓ Scanned for Session Token in URL
- ✓ Scanned for API endpoints
- ✓ Scanned for emails
- ✓ Scanned for missing HTTP header - Rate Limit

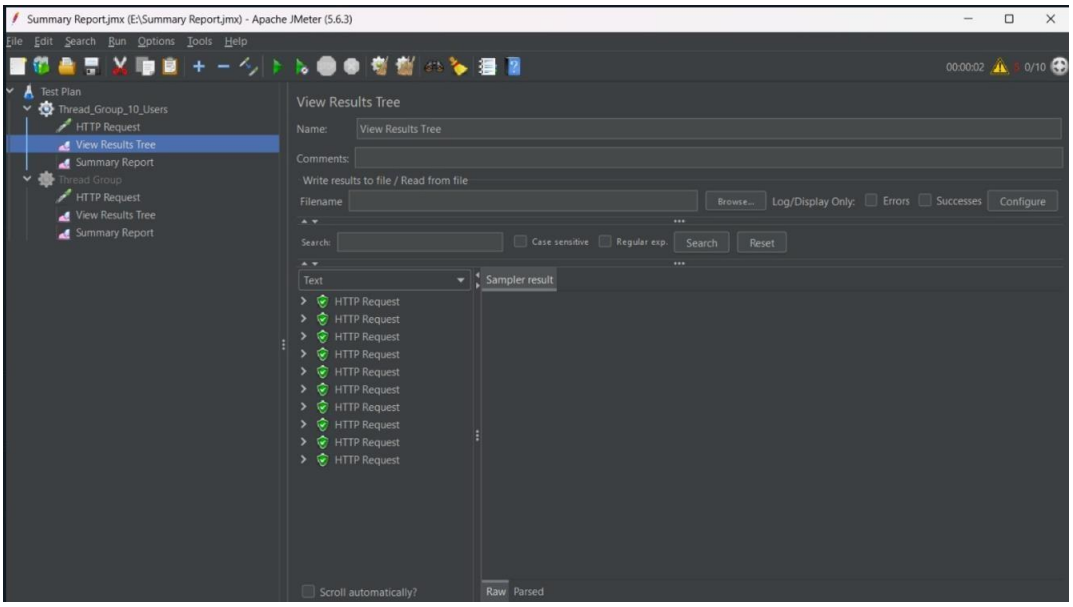
1. Load Testing and Stress Testing (ApacheJmeter)

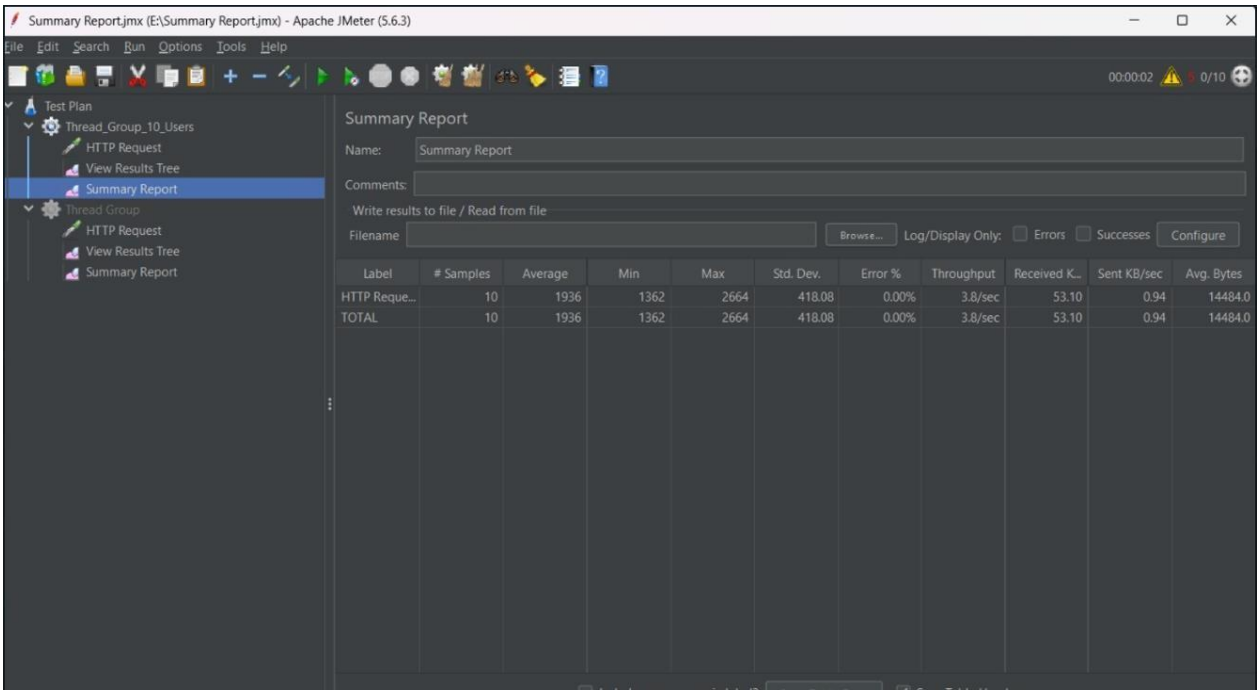
- Testing Home Module

GET request to PATH 'smart-healthcare-appointment-and-triage.onrender.com'

Scenario: We have accessed the home page of IntelliConsult with the same user from multiple hosts (10, 100 and 500) and will be measuring the load balance and throughput of the system.

Summary Outputs for the following and results

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File Edit Search Run Options Tools Help
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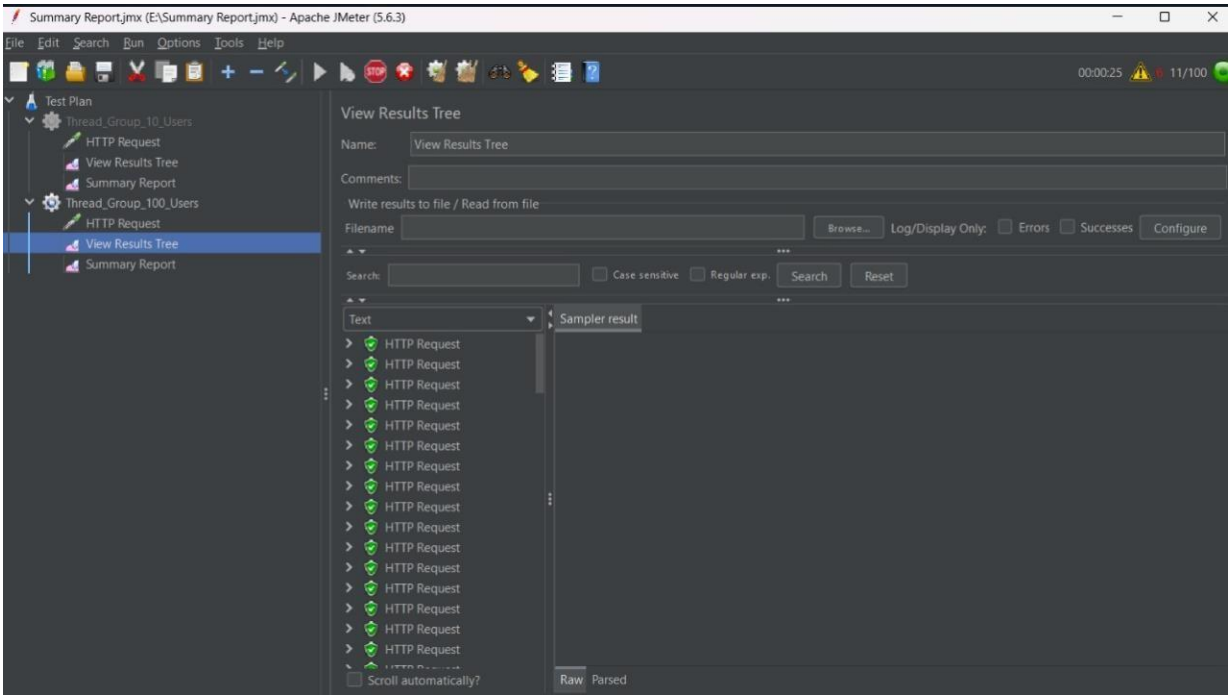
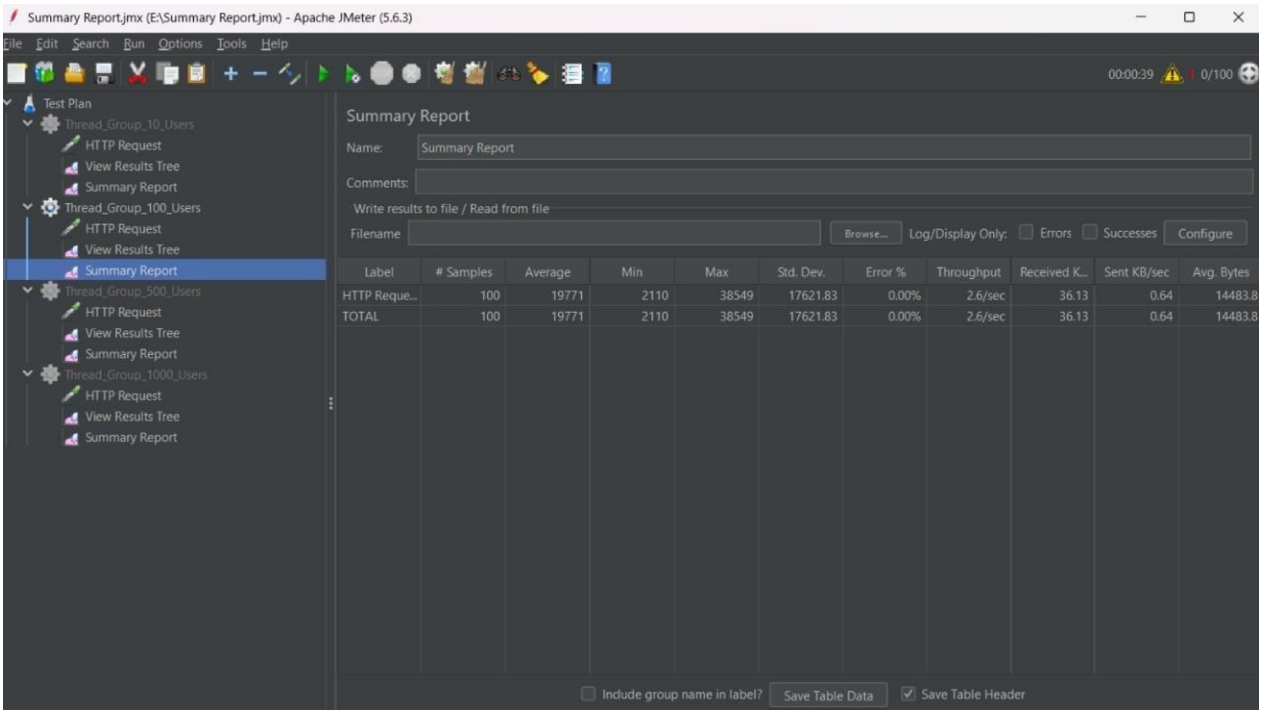
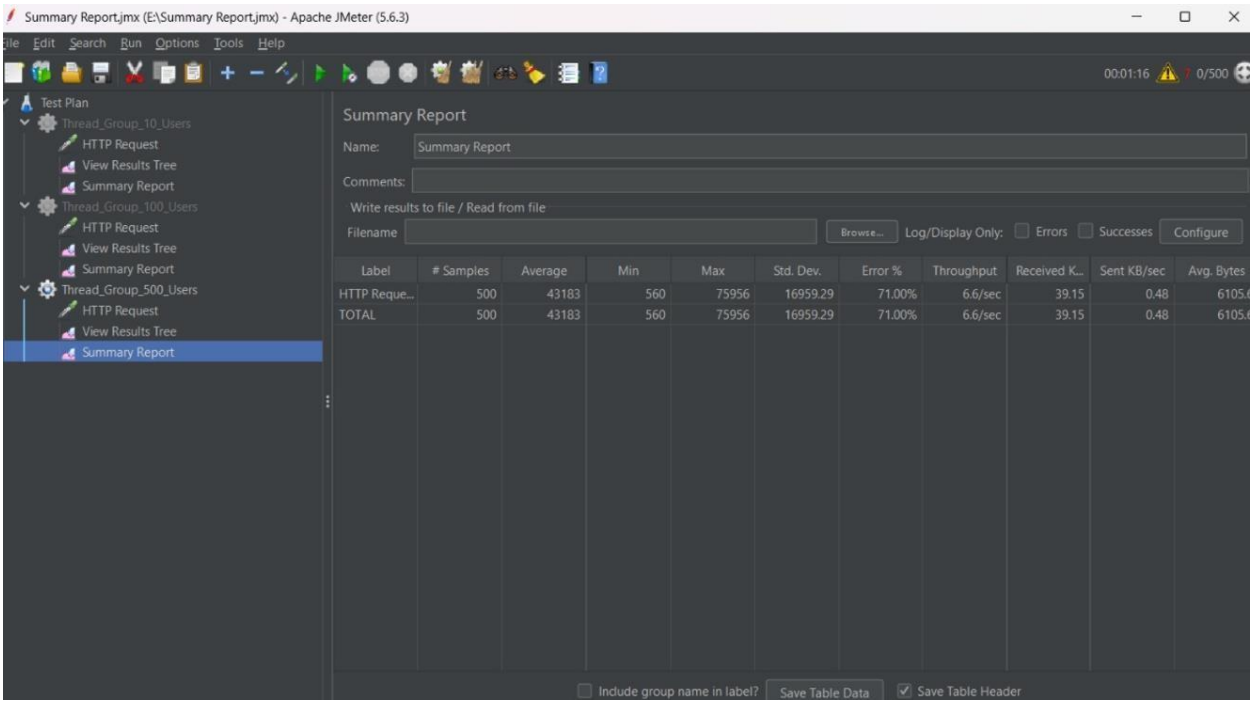
Test Plan
Thread_Group_10_Users
HTTP Request
View Results Tree
Summary Report
Thread Group
HTTP Request
View Results Tree
Summary Report
Summary Report
Name: Summary Report
Comments:
Write results to file / Read from file
Filename
Browse...
Log/Display Only: Errors Successes
Configure
Label # Samples Average Min Max Std. Dev. Error % Throughput Received K... Sent KB/sec Avg. Bytes
HTTP Reque... 10 1936 1362 2664 418.08 0.00% 3.8/sec 53.10 0.94 14484.0
TOTAL 10 1936 1362 2664 418.08 0.00% 3.8/sec 53.10 0.94 14484.0


Summary Report.jmx (E:\Summary Report.jmx) - Apache JMeter (5.6.3)
File Edit Search Run Options Tools Help
00:00:25 11/100
Test Plan
Thread_Group_10_Users
HTTP Request
View Results Tree
Summary Report
Thread_Group_100_Users
HTTP Request
View Results Tree
Summary Report
View Results Tree
Name: View Results Tree
Comments:
Write results to file / Read from file
Filename
Browse...
Log/Display Only: Errors Successes
Configure
Search:
Case sensitive
Regular exp.
Search
Reset
Text
Sampler result
HTTP Request
Scroll automatically?
Raw
Parsed





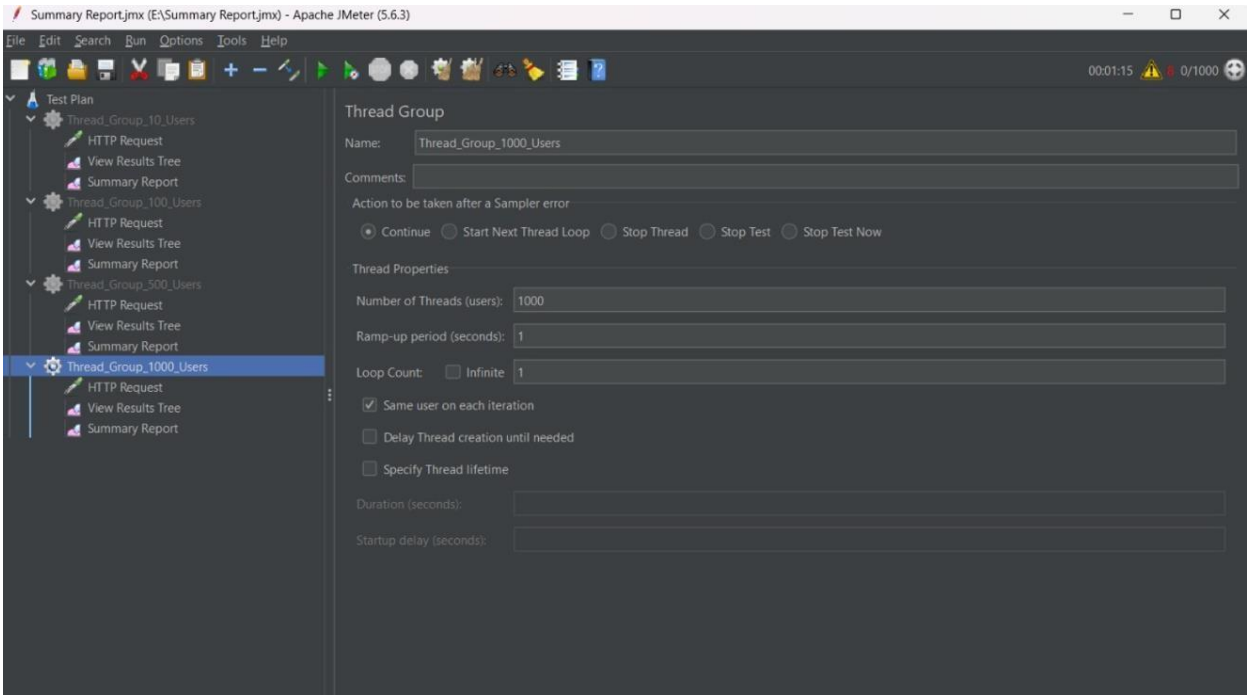
Analysis

The summary report shows that with 500 concurrent users, the home page has a throughput of 6.6 seconds and an error rate of 71%, indicating it cannot handle this level of traffic. With 100 concurrent users, the throughput is 52.3 seconds with a 0% error rate, demonstrating the system can manage this load comfortably. For 10 concurrent users, the throughput is 3.8 seconds with an error rate of 0%.

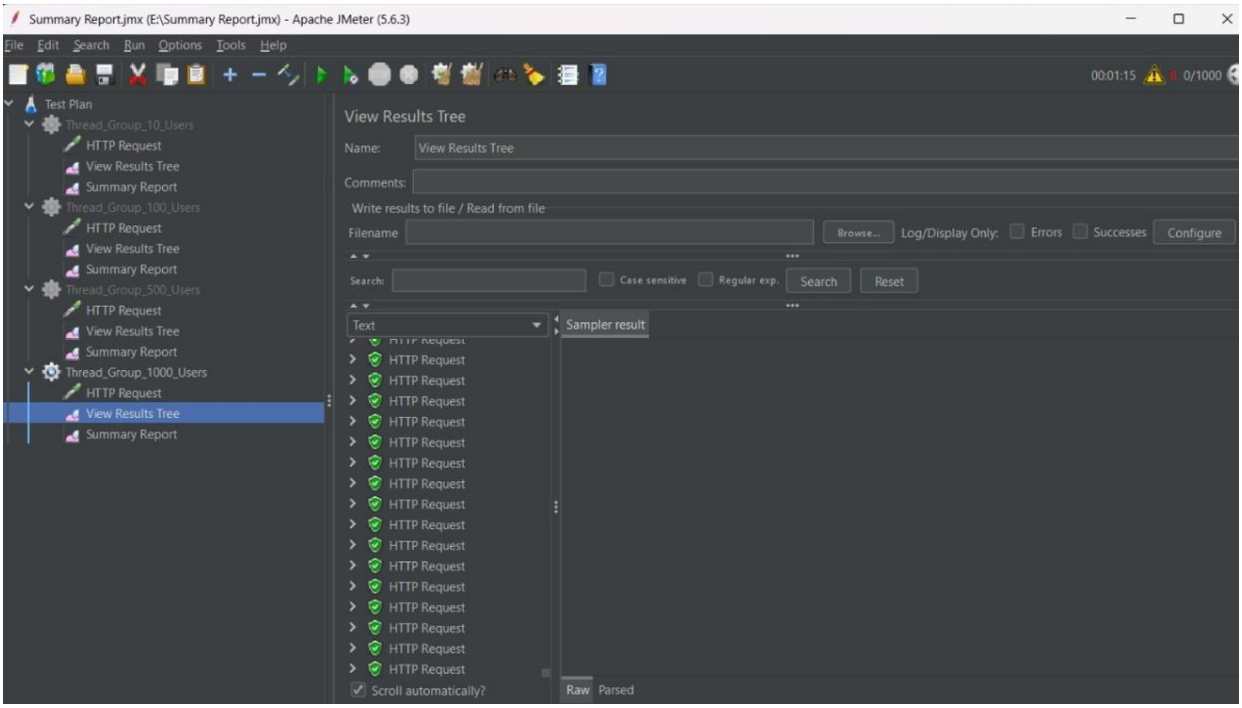
- Testing Home module with stress testing (1000 users)

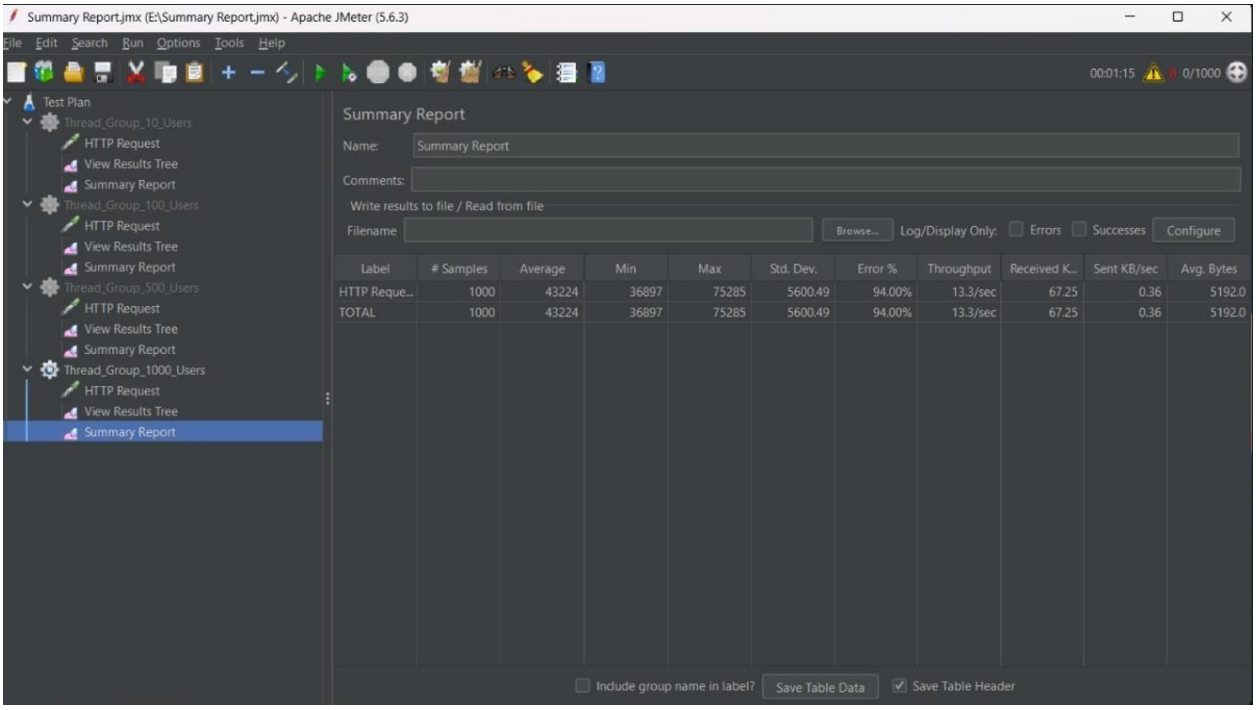
GET request to PATH 'smart-healthcare-appointment-and-triage.onrender.com'

Scenario: We have accessed the home page of IntelliConsult with the same user from multiple hosts (1000) and will be measuring the load balance and throughput of the system



Summary outputs for 1000 concurrent users





Analysis

The summary report shows that with 1000 concurrent users, the home page has a throughput of 13.3 seconds and an error rate of 94%, indicating it cannot handle this level of traffic