**Security Audit Logging with Error Handling**

**Purpose**

This document defines how **Security Audit Logging** and **Error Handling** should be implemented in the application. The goal is to **track security-related activities and errors**, provide transparency, enable compliance reviews, and support troubleshooting.

**1. Audit Log Table Schema**

| **Field** | **Type** | **Description** |
| --- | --- | --- |
| timestamp | datetime | Exact time the event occurred (UTC recommended). |
| event\_type | string | Type of event (e.g., Login Success, Login Failed, Admin Access). |
| user | string | Username or email of the user associated with the event. |
| ip\_address | string | Public and/or internal IP address of the user making the request. |
| description | text | Human-readable description of the action or error that occurred. |

**🔒 2. Required Logged Events**

**✅ Success Events:**

* Login Success
* Admin Access
* Logout
* File Uploaded
* Questionnaire Submitted
* Audit Score Generated

**❌ Error Events (Error Handling):**

* Login Failed — include reason (e.g., Invalid credentials)
* Unauthorized Access Attempt — include endpoint and IP
* Form Submission Failed — include reason (e.g., validation error)
* Internal Server Error — log traceback message or status code
* File Upload Error — include file name and reason (e.g., unsupported type)

**🔁 3. Error Handling Workflow**

When an error occurs:

1. **Catch the error** using try-except blocks or appropriate error middleware.
2. **Record the error** in the audit log table using the format above.
3. **Provide user feedback** (e.g., "Login failed, please try again").
4. **Optionally trigger security alerts** (e.g., 5 failed logins within 2 minutes).

**💡 4. Sample Logs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Timestamp** | **Event Type** | **User** | **IP Address** | **Description** |
| 2025-06-11 09:20:20 | Admin Access | admin | 102.89.34.49, 10.81.0.9 | Admin login successful |
| 2025-06-11 09:19:00 | Login Failed | admin | 102.89.34.49 | Login failed: Invalid credentials |
| 2025-06-11 09:13:36 | Login Success | oabinusawa@3consult-ng.com | 10.81.10.41 | User successfully logged in |
| 2025-06-11 09:22:45 | File Upload Error | admin | 10.81.0.9 | Upload failed: File type not supported |
| 2025-06-11 09:25:10 | Questionnaire Submitted | user@example.com | 10.81.0.10 | User completed and submitted form |