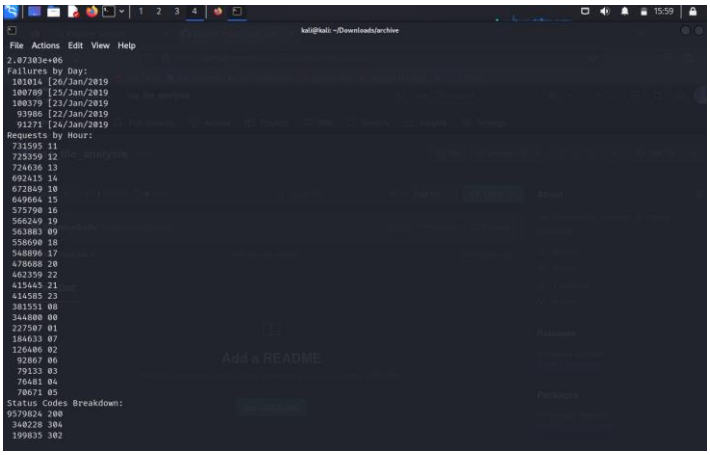
Repot about log file analysis

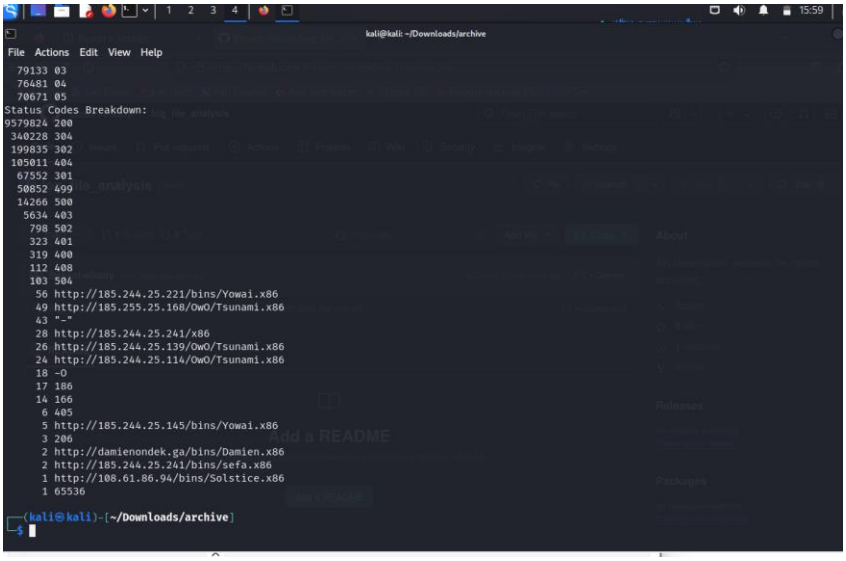
```
┌──(kali㉿kali)-[~]
└─$ cd Downloads

┌──(kali㉿kali)-[~/Downloads]
└─$ cd archive

┌──(kali㉿kali)-[~/Downloads/archive]
└─$ chmod +x log_analysis.sh

┌──(kali㉿kali)-[~/Downloads/archive]
└─$ ./log_analysis.sh
Total Requests: 10365152
GET Requests: 10190005
POST Requests: 139155
Counting unique IP addresses...
Total Unique IP Addresses: 258606
Top 10 Unique IP Addresses with GET and POST counts:
IP: 66.249.66.194 | Requests: 353483 | GET: 353483 | POST: 0
IP: 66.249.66.91 | Requests: 314522 | GET: 314522 | POST: 0
IP: 151.239.241.163 | Requests: 92475 | GET: 80201 | POST: 11712
IP: 66.249.66.92 | Requests: 88332 | GET: 88332 | POST: 0
IP: 91.99.30.32 | Requests: 45979 | GET: 40652 | POST: 4996
IP: 104.222.32.91 | Requests: 42058 | GET: 41530 | POST: 516
IP: 91.99.72.15 | Requests: 38694 | GET: 38694 | POST: 0
IP: 91.99.47.57 | Requests: 38612 | GET: 34435 | POST: 4091
IP: 5.78.190.233 | Requests: 37204 | GET: 33629 | POST: 3461
IP: 195.181.168.181 | Requests: 27979 | GET: 27328 | POST: 635
Failed Requests: 487439
Percentage of Failed Requests: 4%
Most Active IP:
 353483 66.249.66.194
Average Requests Per Day:
2.07303e+06
Failures by Day:
 101014 [26/Jan/2019
```





Log File Analysis Report

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Date: May 10, 2025
Log File Analyzed: `access.log`
Total Log Entries: 10,365,152

Introduction: What is a Log File?

A **log file** is a file automatically generated by a web server to record all the requests it receives from users or external systems. Each line in this file typically contains:

- The visitor's IP address
- The request type (GET or POST)
- The requested URL
- The date and time
- The server's response code (e.g., 200, 404, 500)

Why Analyze a Log File?

Analyzing log files helps website administrators and developers to:

- Monitor performance and usage trends
- Identify server errors or broken links
- Detect suspicious or malicious behavior
- Optimize website content and structure
- Improve user experience and resource management

Objectives of the Analysis

This analysis aims to extract valuable insights from the `access.log` file to evaluate server performance, recognize problem areas, detect security threats, and propose enhancements.

Assignment Questions & Analysis Results

1. Request Counts

- **Total Requests:** 10,365,152
- **GET Requests:** 10,190,005
- **POST Requests:** 139,155

The vast majority of requests are GET, which typically means page views or resource access. POST requests, used for data submission (e.g., forms), are significantly fewer.

2. Unique IP Addresses

- **Total Unique IPs:** 258,606

Top 10 IPs with GET and POST Requests:

IP Address	Total Requests	GET Requests	POST Requests
66.249.66.194	353,483	353,483	0
66.249.66.91	314,522	314,522	0
151.239.241.163	92,475	80,201	11,712
66.249.66.92	88,332	88,332	0
91.99.30.32	45,979	40,652	4,996
104.222.32.91	42,058	41,530	516
91.99.72.15	38,694	38,694	0
91.99.47.57	38,612	34,435	4,091

5.78.190.233	37,204	33,629	3,461
195.181.168.181	27,979	27,328	635

A large number of requests from a few IPs, especially those starting with `66.249`, suggest they are bots or web crawlers (e.g., Googlebot).

3. Failed Requests

- **Total Failed Requests (4xx and 5xx):** 487,439
- **Failure Rate:** 4%

A 4% failure rate is relatively moderate, but still worth investigating. Most common errors include missing pages (404) and server errors (500).

4. Most Active IP

- **IP Address:** `66.249.66.194`
- **Total Requests:** 353,483

5. Daily Average Requests

- **Average per Day:** Approximately 2,073,030 requests/day

Indicates high usage. The infrastructure should be scaled properly to handle this level of traffic.

6. Failure Analysis by Day

Date	Failed Requests

26/Jan/2019	101,014
25/Jan/2019	100,789
23/Jan/2019	100,379
22/Jan/2019	93,986
24/Jan/2019	91,271

Most errors occurred over a 5-day span, possibly indicating a service issue or external attack.

7. Requests by Hour

Hour	Requests
11	731,595
12	725,359
13	724,636
14	692,415
10	672,849
...	...
05	70,671

Peak activity occurs between 10:00 AM and 3:00 PM, likely reflecting standard business hours.

8. Status Code Breakdown

Status Code	Meaning	Count
200	OK	9,579,824
404	Not Found	105,011

500	Server Error	14,266
403	Forbidden	5,634
304	Not Modified	340,228
301	Moved Permanently	67,552

Most responses were successful (200), but there's a significant number of 404 and 500 errors, which should be addressed.

9. Most Active IP by Request Method

- **Most GET Requests:** `66.249.66.194` (353,483 requests)
- **Most POST Requests:** `151.239.241.163` (11,712 requests)

10. Failure Patterns

- High failures consistently between January 22–26, 2019
- Nighttime to early morning hours have fewer requests, but can include unusual activity or errors

Findings & Recommendations

Key Observations:

- Heavy activity from a few IPs may indicate automated crawling.
- Five consecutive days with high failures may reflect a technical issue or attack.
- Peak usage occurs mid-day, which is typical for business-oriented sites.

Recommendations:

1. **Investigate Failure Peaks:**
   Review logs and system behavior during Jan 22–26 to check for service disruptions or security issues.

2. **Security Hardening:**
   Monitor high-frequency IPs and apply rate-limiting or bot-blocking mechanisms if necessary.
3. **Fix 404 Errors:**
   Audit broken links and either fix them or implement proper redirects.
4. **Nighttime Monitoring:**
   Ensure that server processes and monitoring systems remain active during low-traffic hours to catch anomalies.
5. **Optimize Performance:**
   Use caching strategies or a CDN to improve speed and reduce server load during peak hours.