Threat and Weakness Analysis in SimplyTag

ORGADATA COMPANY, LEER

Manoj Selvaraju - 7025649
Vatsal Mahajan - 7025694
Vijay Singh - 7025700

January 15, 2025

Table of Content I

1. Introduction
2. Purpose of Analysis
3. Challenges
4. Knowledge Discovery in Database (KDD) Process
5. Conclusion and Future Scope
6. Literature

Introduction

About ORGADATA:

- Orgadata is a leading software company, Specializes in solutions for window and door construction, offering products like Logikal.
- Logikal is Orgadata's software that helps users design, calculate, and manage the production of windows and doors efficiently from start to finish.

Why?

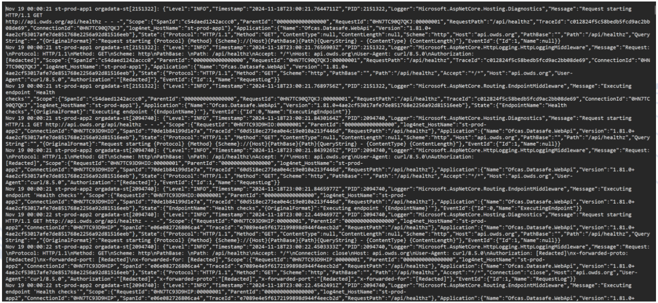
- As a student of Industrial Informatics, We have studied how to digitalize products and processes in line with Industry 4.0 principles.
- In today's digital age, safeguarding sensitive information and system integrity is crucial.
- Threat and Weakness Analysis is an essential step in mitigating risks, preventing breaches, and ensuring operational resilience.

Purpose of Analysis

- Exploit exposed endpoints or unauthorized access.
- Detecting vulnerabilities in Orgadata's systems that could be exploited by malicious actors.
- Prevent unauthorized access attempts.
- Improve data security by safeguarding sensitive information of customer and operational data against breaches.
- Build a predictive model using the KDD process to classify threats and evaluate system requests effectively.
- Provide actionable insights to enhance system security and performance.

Challenges we Faced

- Managing and analyzing large-scale logs for meaningful insights.
- Distinguishing between genuine user activities and malicious attempts.
- Handling complex patterns in user behavior and request logs.



```
Nov 19 00:00:21 st-prod-app1 orgadata-st[2151322]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:21.7644711Z","PID":2151322,"Logger":"Microsoft.AspNetCore.Hosting.Diagnostics","Message":"Request starting
HTTP/1.1 GET
http://api.owds.org/api/healthz - - -","Scope":{"SpanId":"c54daed1242accc0","ParentId":"0000000000000000","RequestId":"0HN7TC90Q7QKJ:00000001","RequestPath":"/api/healthz","TraceId":"c012824f5c58bedb5fcd9ac2bb
08de69","ConnectionId":"0HN7TC90Q7QKJ","log4net_HostName":"st-prod-app1"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"Protocol":"HTTP/1.1","Method":"GET","ContentType":null,"ContentLength":null,"Scheme":"http","Host":"api.owds.org","PathBase":"","Path":"/api/healthz","Query
String":"","{OriginalFormat}":"Request starting {Protocol} {Method} {Scheme}://{Host}{PathBase}{Path}{QueryString} - {ContentType} {ContentLength}"},"EventId":{"Id":1,"Name":null}}
Nov 19 00:00:21 st-prod-app1 orgadata-st[2151322]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:21.7656903Z","PID":2151322,"Logger":"Microsoft.AspNetCore.HttpLogging.HttpLoggingMiddleware","Message":"Request:
\nProtocol: HTTP/1.1\nMethod: GET\nScheme: http\nPathBase: \nPath: /api/healthz\nAccept: */*\nHost: api.owds.org\nUser-Agent: curl/8.5.0\nAuthorization:
[Redacted]","Scope":{"SpanId":"c54daed1242accc0","ParentId":"0000000000000000","RequestId":"0HN7TC90Q7QKJ:00000001","RequestPath":"/api/healthz","TraceId":"c012824f5c58bedb5fcd9ac2bb08de69","ConnectionId":"0HN
7TC90Q7QKJ","log4net_HostName":"st-prod-app1"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"Protocol":"HTTP/1.1","Method":"GET","Scheme":"http","PathBase":"","Path":"/api/healthz","Accept":"*/*","Host":"api.owds.org","User-
Agent":"curl/8.5.0","Authorization":"[Redacted]"},"EventId":{"Id":1,"Name":"RequestLog"}}
Nov 19 00:00:21 st-prod-app1 orgadata-st[2151322]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:21.7689756Z","PID":2151322,"Logger":"Microsoft.AspNetCore.Routing.EndpointMiddleware","Message":"Executing
endpoint 'Health
checks'","Scope":{"SpanId":"c54daed1242accc0","ParentId":"0000000000000000","RequestId":"0HN7TC90Q7QKJ:00000001","RequestPath":"/api/healthz","TraceId":"c012824f5c58bedb5fcd9ac2bb08de69","ConnectionId":"0HN7TC
90Q7QKJ","log4net_HostName":"st-prod-app1"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"EndpointName":"Health
checks","{OriginalFormat}":"Executing endpoint '{EndpointName}'"},"EventId":{"Id":0,"Name":"ExecutingEndpoint"}}
Nov 19 00:00:21 st-prod-app2 orgadata-st[2094740]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:21.8430164Z","PID":2094740,"Logger":"Microsoft.AspNetCore.Hosting.Diagnostics","Message":"Request starting
HTTP/1.1 GET http://api.owds.org/api/healthz - - -","Scope":{"RequestId":"0HN7TC93D9HIO:00000001","ParentId":"0000000000000000","log4net_HostName":"st-prod-
app2","ConnectionId":"0HN7TC93D9HIO","SpanId":"70de1b84199d1e7a","TraceId":"60d518ec273ea0e4c19e010a213f446d","RequestPath":"/api/healthz"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"Protocol":"HTTP/1.1","Method":"GET","ContentType":null,"ContentLength":null,"Scheme":"http","Host":"api.owds.org","PathBase":"","Path":"/api/healthz","Query
String":"","{OriginalFormat}":"Request starting {Protocol} {Method} {Scheme}://{Host}{PathBase}{Path}{QueryString} - {ContentType} {ContentLength}"},"EventId":{"Id":1,"Name":null}}
Nov 19 00:00:21 st-prod-app2 orgadata-st[2094740]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:21.8439265Z","PID":2094740,"Logger":"Microsoft.AspNetCore.HttpLogging.HttpLoggingMiddleware","Message":"Request:
\nProtocol: HTTP/1.1\nMethod: GET\nScheme: http\nPathBase: \nPath: /api/healthz\nAccept: */*\nHost: api.owds.org\nUser-Agent: curl/8.5.0\nAuthorization:
[Redacted]","Scope":{"RequestId":"0HN7TC93D9HIO:00000001","ParentId":"0000000000000000","log4net_HostName":"st-prod-
app2","ConnectionId":"0HN7TC93D9HIO","SpanId":"70de1b84199d1e7a","TraceId":"60d518ec273ea0e4c19e010a213f446d","RequestPath":"/api/healthz"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"Protocol":"HTTP/1.1","Method":"GET","Scheme":"http","PathBase":"","Path":"/api/healthz","Accept":"*/*","Host":"api.owds.org","User-
Agent":"curl/8.5.0","Authorization":"[Redacted]"},"EventId":{"Id":1,"Name":"RequestLog"}}
Nov 19 00:00:21 st-prod-app2 orgadata-st[2094740]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:21.8465977Z","PID":2094740,"Logger":"Microsoft.AspNetCore.Routing.EndpointMiddleware","Message":"Executing
endpoint 'Health checks'","Scope":{"RequestId":"0HN7TC93D9HIO:00000001","ParentId":"0000000000000000","log4net_HostName":"st-prod-
app2","ConnectionId":"0HN7TC93D9HIO","SpanId":"70de1b84199d1e7a","TraceId":"60d518ec273ea0e4c19e010a213f446d","RequestPath":"/api/healthz"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"EndpointName":"Health checks","{OriginalFormat}":"Executing endpoint '{EndpointName}'"},"EventId":{"Id":0,"Name":"ExecutingEndpoint"}}
Nov 19 00:00:22 st-prod-app2 orgadata-st[2094740]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:22.4494697Z","PID":2094740,"Logger":"Microsoft.AspNetCore.Hosting.Diagnostics","Message":"Request starting
HTTP/1.1 GET http://api.owds.org/api/healthz - - -","Scope":{"RequestId":"0HN7TC93D9HIP:00000001","ParentId":"0000000000000000","log4net_HostName":"st-prod-
app2","ConnectionId":"0HN7TC93D9HIP","SpanId":"e06e082726806ca4","TraceId":"e7089e4e5f6172199898d944f4eecb2d","RequestPath":"/api/healthz"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"Protocol":"HTTP/1.1","Method":"GET","ContentType":null,"ContentLength":null,"Scheme":"http","Host":"api.owds.org","PathBase":"","Path":"/api/healthz","Query
String":"","{OriginalFormat}":"Request starting {Protocol} {Method} {Scheme}://{Host}{PathBase}{Path}{QueryString} - {ContentType} {ContentLength}"},"EventId":{"Id":1,"Name":null}}
Nov 19 00:00:22 st-prod-app2 orgadata-st[2094740]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:22.4503333Z","PID":2094740,"Logger":"Microsoft.AspNetCore.HttpLogging.HttpLoggingMiddleware","Message":"Request:
\nProtocol: HTTP/1.1\nMethod: GET\nScheme: http\nPathBase: \nPath: /api/healthz\nAccept: */*\nConnection: close\nHost: api.owds.org\nUser-Agent: curl/8.5.0\nAuthorization: [Redacted]\nx-forwarded-proto:
[Redacted]\nx-forwarded-port: [Redacted]\nx-forwarded-for: [Redacted]","Scope":{"RequestId":"0HN7TC93D9HIP:00000001","ParentId":"0000000000000000","log4net_HostName":"st-prod-
app2","ConnectionId":"0HN7TC93D9HIP","SpanId":"e06e082726806ca4","TraceId":"e7089e4e5f6172199898d944f4eecb2d","RequestPath":"/api/healthz"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
4ae2cf53017afe7de851768e2256a92d81516eeb"},"State":{"Protocol":"HTTP/1.1","Method":"GET","Scheme":"http","PathBase":"","Path":"/api/healthz","Accept":"*/*","Connection":"close","Host":"api.owds.org","User-
Agent":"curl/8.5.0","Authorization":"[Redacted]","x-forwarded-proto":"[Redacted]","x-forwarded-port":"[Redacted]","x-forwarded-for":"[Redacted]"},"EventId":{"Id":1,"Name":"RequestLog"}}
Nov 19 00:00:22 st-prod-app2 orgadata-st[2094740]: {"Level":"INFO","Timestamp":"2024-11-18T23:00:22.4542491Z","PID":2094740,"Logger":"Microsoft.AspNetCore.Routing.EndpointMiddleware","Message":"Executing
endpoint 'Health checks'","Scope":{"RequestId":"0HN7TC93D9HIP:00000001","ParentId":"0000000000000000","log4net_HostName":"st-prod-
app2","ConnectionId":"0HN7TC93D9HIP","SpanId":"e06e082726806ca4","TraceId":"e7089e4e5f6172199898d944f4eecb2d","RequestPath":"/api/healthz"},"Application":{"Name":"Ofcas.Datasafe.WebApi","Version":"1.81.0+
```

Figure: Raw log data

Knowledge Discovery in Database (KDD) Process

Data Selection:

Identify and Extract relevant data from log files while filtering out irrelevant information.

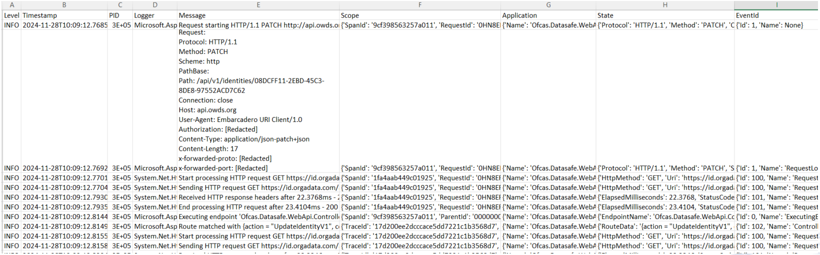
- **Data Origin:** Logs were sourced from monitoring tools and event management systems, specifically collected via the *Graylog server*.
- **Format:** *.log* format.
- **Size:** 3.34 GB
- **Features:** Timestamps, PID, Logger, Message, Scope (e.g., TraceId, RequestID), Application, State, EventID.

Data Preparation:

Making dataset clean, consistent, and ready for analysis.

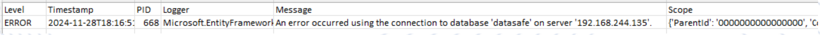
- **Merging and Conversion:**
  - Consolidated nine individual log files into a single file.
  - Converted the consolidated file from *.log* format to *CSV* format.
- **Initial Cleaning:**
  - Removed entries which are lacking valid **TraceId**.
  - Excluded error or warning messages.
- **Key Attributes:**
  - **TraceId:** Tracks individual requests across log entries.
  - **HTTP Status Code:** Provides insights into request results:
    - **200:** Successful requests.
    - **404:** Client-side errors (e.g., broken links).
    - **500:** Server-side errors indicating system issues.
  - **Paths:** Represents the API endpoint or resource accessed.
  - **User-Agent** Captures details about the client or system making the request.

Data Preparation:



A	B	C	D	E	F	G	H	I
Level	Timestamp	PID	Logger	Message	Scope	Application	State	EventId
INFO	2024-11-28T10:09:12.7685	3E+05	Microsoft.Asp	Request starting HTTP/1.1 PATCH http://api.owds.o Request: Protocol: HTTP/1.1 Method: PATCH Scheme: http PathBase: Path: /api/v1/identities/08DCFF11-2EBD-45C3- 8DE8-97552ACD7C62 Connection: close Host: api.owds.org User-Agent: Embarcadero URI Client/1.0 Authorization: [Redacted] Content-Type: application/json-patch+json Content-Length: 17 x-forwarded-proto: [Redacted]	{'SpanId': '9cf398563257a011', 'RequestId': '0HN8E	{'Name': 'Ofcas.Datasafe.WebA	{'Protocol': 'HTTP/1.1', 'Method': 'PATCH', 'C	{'Id': 1, 'Name': None}
INFO	2024-11-28T10:09:12.7692	3E+05	Microsoft.Asp	x-forwarded-port: [Redacted]	{'SpanId': '9cf398563257a011', 'RequestId': '0HN8E	{'Name': 'Ofcas.Datasafe.WebA	{'Protocol': 'HTTP/1.1', 'Method': 'PATCH', 'S	{'Id': 1, 'Name': 'RequestLo
INFO	2024-11-28T10:09:12.7701	3E+05	System.Net.H	Start processing HTTP request GET https://id.orgada	{'SpanId': '1fa4aab449c01925', 'RequestId': '0HN8E	{'Name': 'Ofcas.Datasafe.WebA	{'HttpMethod': 'GET', 'Uri': 'https://id.orgad	{'Id': 100, 'Name': 'Request
INFO	2024-11-28T10:09:12.7704	3E+05	System.Net.H	Sending HTTP request GET https://id.orgadata.com/	{'SpanId': '1fa4aab449c01925', 'RequestId': '0HN8E	{'Name': 'Ofcas.Datasafe.WebA	{'HttpMethod': 'GET', 'Uri': 'https://id.orgad	{'Id': 100, 'Name': 'Request
INFO	2024-11-28T10:09:12.7930	3E+05	System.Net.H	Received HTTP response headers after 22.3768ms -	{'SpanId': '1fa4aab449c01925', 'RequestId': '0HN8E	{'Name': 'Ofcas.Datasafe.WebA	{'ElapsedMilliseconds': 22.3768, 'StatusCode	{'Id': 101, 'Name': 'Request
INFO	2024-11-28T10:09:12.7935	3E+05	System.Net.H	End processing HTTP request after 23.4104ms - 200	{'SpanId': '1fa4aab449c01925', 'RequestId': '0HN8E	{'Name': 'Ofcas.Datasafe.WebA	{'ElapsedMilliseconds': 23.4104, 'StatusCode	{'Id': 101, 'Name': 'Request
INFO	2024-11-28T10:09:12.8144	3E+05	Microsoft.Asp	Executing endpoint 'Ofcas.Datasafe.WebApi.Controll	{'SpanId': '9cf398563257a011', 'ParentId': '000000	{'Name': 'Ofcas.Datasafe.WebA	{'EndpointName': 'Ofcas.Datasafe.WebApi.Cc	{'Id': 0, 'Name': 'ExecutingE
INFO	2024-11-28T10:09:12.8149	3E+05	Microsoft.Asp	Route matched with {action = "UpdateIdentityV1", c	{'TraceId': '17d200ee2dcccace5dd7221c1b3568d7',	{'Name': 'Ofcas.Datasafe.WebA	{'RouteData': '{action = "UpdateIdentityV1",	{'Id': 102, 'Name': 'Controll
INFO	2024-11-28T10:09:12.8155	3E+05	System.Net.H	Start processing HTTP request GET https://id.orgada	{'TraceId': '17d200ee2dcccace5dd7221c1b3568d7',	{'Name': 'Ofcas.Datasafe.WebA	{'HttpMethod': 'GET', 'Uri': 'https://id.orgad	{'Id': 100, 'Name': 'Request
INFO	2024-11-28T10:09:12.8158	3E+05	System.Net.H	Sending HTTP request GET https://id.orgadata.com/	{'TraceId': '17d200ee2dcccace5dd7221c1b3568d7',	{'Name': 'Ofcas.Datasafe.WebA	{'HttpMethod': 'GET', 'Uri': 'https://id.orgad	{'Id': 100, 'Name': 'Request

Figure: 2.CSV File



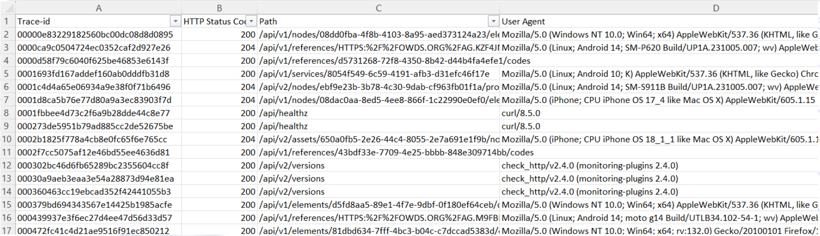
Level	Timestamp	PID	Logger	Message	Scope
ERROR	2024-11-28T18:16:5	668	Microsoft.EntityFramework	An error occurred using the connection to database 'datasafe' on server '192.168.244.135'.	{'ParentId': '0000000000000000', 'C

Figure: 3.Error Message

Data Transformation

Restructure and manipulate the cleaned data for analysis.

- Grouped log entries by TraceId to rebuild complete request flows
- Parsed fields from nested JSON structures: TraceId, HTTP Status Code, Path, User-Agent.
- Transformed each log entry into a distinct row, aligning TraceId with its corresponding attributes for seamless analysis.



	A	B	C	D
1	Trace-id	HTTP Status Coc	Path	User Agent
2	00000e83229182560bc00dc08d8d0895	200	/api/v1/nodes/08dd0fba-4f8b-4103-8a95-aed373124a23/ele	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like G
3	0000ca9c0504724ec0352caf2d927e26	204	/api/v1/references/HTTPS:%2F%2FOWDS.ORG%2FAG.KZF4J	Mozilla/5.0 (Linux; Android 14; SM-P620 Build/UP1A.231005.007; wv) AppleWeb
4	0000d58f79c6040f625be46853e6143f	200	/api/v1/references/d5731268-72f8-4350-8b42-d44b4fa4efe1/codes	
5	0001693fd167addef160ab0dddfb31d8	200	/api/v1/services/8054f549-6c59-4191-afb3-d31efc46f17e	Mozilla/5.0 (Linux; Android 10; K) AppleWebKit/537.36 (KHTML, like Gecko) Chr
6	0001c4d4a65e06934a9e38f0f71b6496	204	/api/v2/nodes/ebf9e23b-3b78-4c30-9dab-cf963fb01f1a/pro	Mozilla/5.0 (Linux; Android 14; SM-S911B Build/UP1A.231005.007; wv) AppleWe
7	0001d8ca5b76e77d80a9a3ec83903f7d	204	/api/v1/nodes/08dac0aa-8ed5-4ee8-866f-1c22990e0ef0/ele	Mozilla/5.0 (iPhone; CPU iPhone OS 17_4 like Mac OS X) AppleWebKit/605.1.15
8	0001fbbee4d73c2f6a9b28dde44c8e77	200	/api/healthz	curl/8.5.0
9	000273de5951b79ad885cc2de52675be	200	/api/healthz	curl/8.5.0
10	0002b1825f778a4cb8e0fc65f6e765cc	204	/api/v2/assets/650a0fb5-2e26-44c4-8055-2e7a691e1f9b/nc	Mozilla/5.0 (iPhone; CPU iPhone OS 18_1_1 like Mac OS X) AppleWebKit/605.1.1
11	0002f7cc5075af12e46bd55ee4636d81	200	/api/v1/references/43bdf33e-7709-4e25-bbbb-848e309714bb/codes	
12	000302bc46d6fb65289bc2355604cc8f	200	/api/v2/versions	check_http/v2.4.0 (monitoring-plugins 2.4.0)
13	00030a9aeb3eaa3e54a28873d94e81ea	200	/api/v2/versions	check_http/v2.4.0 (monitoring-plugins 2.4.0)
14	000360463cc19ebcad352f42441055b3	200	/api/v2/versions	check_http/v2.4.0 (monitoring-plugins 2.4.0)
15	000379bd694343567e14425b1985acfe	200	/api/v1/elements/d5fd8aa5-89e1-4f7e-9dbf-0f180ef64ceb/	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like G
16	000439937e3f6ec27d4ee47d56d33d57	200	/api/v1/references/HTTPS:%2F%2FOWDS.ORG%2FAG.M9FB	Mozilla/5.0 (Linux; Android 14; moto g14 Build/UTLB34.102-54-1; wv) AppleWeb
17	000472fc41c4d21ae9516f91ec850212	200	/api/v1/elements/81dbd634-7fff-4bc3-b04c-c7dccad5383d/	Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:132.0) Gecko/20100101 Firefox/

Figure: 4.Bar Chart

Data Mining

Feature Extraction

Extracted hidden patterns and anomalies from the selected data.

- **Path-Based Features (Approach 1 & 2):**
  - Extracted key features based on the Path attribute. Features included:
    - **Path length**
    - **Presence of special characters**
    - **SQL keywords**
    - **Path traversal attempts**
    - **Suspicious file extensions**
  - Applied TF-IDF vectorization on the Path attribute to convert API endpoint access into numerical features for machine learning.
- **User-Agent Analysis (Approach 3):**
  - Analyzed User-Agent strings to detect patterns linked to suspicious or malicious activities.

Data Mining

Clustering and Anomaly Detection

- Approach 1: Path and Frequency-Based Clustering
  - Combined extracted path features with frequency metrics and HTTP status codes.
  - Used **DBSCAN** for clustering and **Isolation Forest** for outlier detection.
- Approach 2: TF-IDF and Clustering
  - Utilized TF-IDF vectorized features and numeric attributes for clustering.
  - Integrated **DBSCAN** and **Isolation Forest** for robust anomaly detection, flagging unusual requests.
- Approach 3: User-Agent Pattern Analysis
  - Focused on identifying suspicious behaviors using **User-Agent** patterns.

Data Modelling

Used Unsupervised learning to perform clustering and anomaly detection

Model 1: DBSCAN

- **Purpose:** Group data points based on density; flag points that don't belong to any cluster as anomalies.
- **Key Parameters:**
  - **eps: 0.5**
  - **min_samples: 5**
- **Outcome:** Requests not assigned to any cluster (cluster = -1) were flagged as anomalies.

Model 2: Isolation Forest

- **Purpose:** Detect anomalies by isolating data points, as anomalies are easier to separate from the rest of the data.
- **Key Parameters:**
  - **n_estimators: 100**
  - **contamination: 0.01**
  - **random_state: 42**
- **Outcome:** Anomalous requests were flagged with a value of -1.

Validation/ Verification

Ensure the reliability and accuracy of data mining and anomaly detection processes

DBSCAN Validation

- **Cluster Review:** Verified data points within clusters had similar patterns.
- **Anomaly Inspection:** Manually checked anomalies (Cluster = -1) for normal deviations.

Isolation Forest Validation

- **Anomaly Score Distribution:** Assessed scores to differentiate anomalies from regular requests.
- **Manual Inspection:** Reviewed flagged anomalies to confirm their unusual characteristics.

Data Visualization

- Figure.5 visualizing anomalies identified via Path and TraceId, showing clustering and deviations from normal access patterns.
- FIgure.6 shows analysis of anomalies detected based on User-Agent behaviors

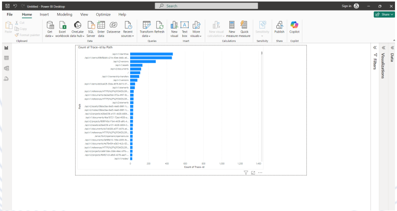


Figure: 5.Bar Chart

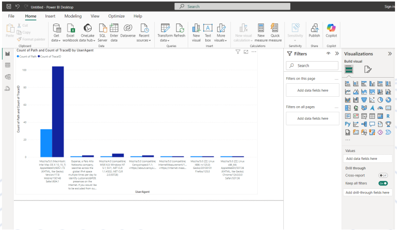

Untitled - Power BI Desktop
Search
Sign in
File
Home
Insert
Modeling
View
Optimize
Help
Count of Path and Count of TraceID by UserAgent
Count of Path
Count of TraceID
100
80
60
40
20
0
Count of Path and Count of TraceID
Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/605.1.15 (KHTML, like Gecko) Version/17.8 Mobile/15E148 Safari/604.1
Expanse, a Palo Alto Networks company, searches across the global IPv4 space multiple times per day to identify customers&#39; presences on the Internet. If you would like to be excluded from ou...
Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1; SV1; .NET CLR 1.1.4322; .NET CLR 2.0.50728)
Mozilla/5.0 (compatible; CensysInspect/1.1; +https://about.censys.i...
Mozilla/5.0 (compatible; InternetMeasurement/1... +https://internet-meas...
Mozilla/5.0 (X11; Linux i686; rv:125.0) Gecko/20100101 Firefox/125.0
Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/124.0.0.0 Safari/537.36
UserAgent
Filters
Search
Filters on this page
Add data fields here
Filters on all pages
Add data fields here
Visualizations
Build visual
Values
Add data fields here
Drill through
Cross-report
Keep all filters
Add drill-through fields here

Figure: 6.Bar Chart

.

Conclusion and Future Scope

Conclusion:

- XXX

Future Scope:

- XXX

Literature

- XXX

Thank you

for your attention