Blue Team: Summary of Operations

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Network Topology

The following machines were identified on the network:

- **Kali**
  - **Operating System**: Debian Kali 5.4.0
  - **Purpose**: The Penetration Tester (Used to attack other machines)
  - **IP Address**:192.168.1.90
- **ELK**
  - **Operating System**:Ubuntu 18.04
  - **Purpose**:The ELK (Elasticsearch & Kibana) Stack
  - **IP Address**:192.168.1.100
- **Target 1**
  - **Operating System**: Debian GNU/Linux 8
  - **Purpose**: Exposes vulnerable WordPress server. Sends logs to ELK
  - **IP Address**:192.168.1.110/24
- **Target 2**
  - **Operating System**: Debian GNU/Linux 8
  - **Purpose**: Web Server (WordPress Host)
  - **IP Address**:192.168.1.115/24
- **Capstone**
  - **Operating System**: Ubuntu 18.04
  - **Purpose**:The Vulnerable Web Server
  - **IP Address**:192.168.1.105

Description of Targets

Two VMs on the network were vulnerable to attack: Target 1 (192.168.1.110) and Target 2 (192.168.1.115). Only Target 1 is covered and was attacked.

Each VM functions as an Apache web server and has SSH enabled, so ports 80 and 22 are possible ports of entry for attackers.

Target 1 is an Apache web server and has SSH enabled, so ports 80 and 22 are possible ports of entry for attackers. As such, the following alerts have been implemented: CPU usage monitoring, Excessive http errors, Http request size monitoring.

Monitoring the Targets

This scan identifies the services below as potential points of entry: nmap -A 192.168.1.90/24

Target 1

- Port 22/TCP Open SSH OpenSSH 6.7p1 Debian 5+deb8u4
- Port 80/TCP Open HTTP Apache httpd 2.4.10 (Debian)

```
Nmap scan report for 192.168.1.110
Host is up (0.00080s latency).
Not shown: 995 closed ports
PORT     STATE SERVICE     VERSION
22/tcp   open  ssh         OpenSSH 6.7p1 Debian 5+deb8u4 (protocol 2.0)
| ssh-hostkey:
|   1024 26:81:c1:f3:5e:01:ef:93:49:3d:91:1e:ae:8b:3c:fc (DSA)
|   2048 31:58:01:19:4d:a2:80:a6:b9:0d:40:98:1c:97:aa:53 (RSA)
|   256 1f:77:31:19:de:b0:e1:6d:ca:77:07:76:84:d3:a9:a0 (ECDSA)
|_  256 0e:85:71:a8:a2:c3:08:69:9c:91:c0:3f:84:18:df:ae (ED25519)
80/tcp   open  http        Apache httpd 2.4.10 ((Debian))
|_http-server-header: Apache/2.4.10 (Debian)
|_http-title: Raven Security
111/tcp open  rpcbind     2-4 (RPC #100000)
| rpcinfo:
|   program version    port/proto  service
|   100000  2,3,4        111/tcp   rpcbind
|   100000  2,3,4        111/udp   rpcbind
|   100000  3,4          111/tcp6  rpcbind
|   100000  3,4          111/udp6  rpcbind
|   100024  1          37667/tcp   status
|   100024  1          42075/udp   status
|   100024  1          49788/udp6  status
|_  100024  1          59693/tcp6  status
139/tcp open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp open  netbios-ssn Samba smbd 4.2.14-Debian (workgroup: WORKGROUP)
MAC Address: 00:15:5D:00:04:10 (Microsoft)
Device type: general purpose
Running: Linux 3.X|4.X
OS CPE: cpe:/o:linux:linux_kernel:3 cpe:/o:linux:linux_kernel:4
OS details: Linux 3.2 - 4.9
Network Distance: 1 hop
Service Info: Host: TARGET1; OS: Linux; CPE: cpe:/o:linux:linux_kernel

Host script results:
|_clock-skew: mean: -3h19m59s, deviation: 5h46m24s, median: 0s
|_nbstat: NetBIOS name: TARGET1, NetBIOS user: <unknown>, NetBIOS MAC: <unk
nown> (unknown)
```

Traffic to these services should be carefully monitored. To this end, we have implemented the alerts below:

Excessive HTTP Errors

Excessive HTTP Errors is implemented as follows:

WHEN count() GROUPED OVER top 5 'http.response.status_code' IS ABOVE 400 FOR THE LAST 5 minutes

Metric:

WHEN count() GROUPED OVER top 5 ‘http.response.status_code’

Threshold:

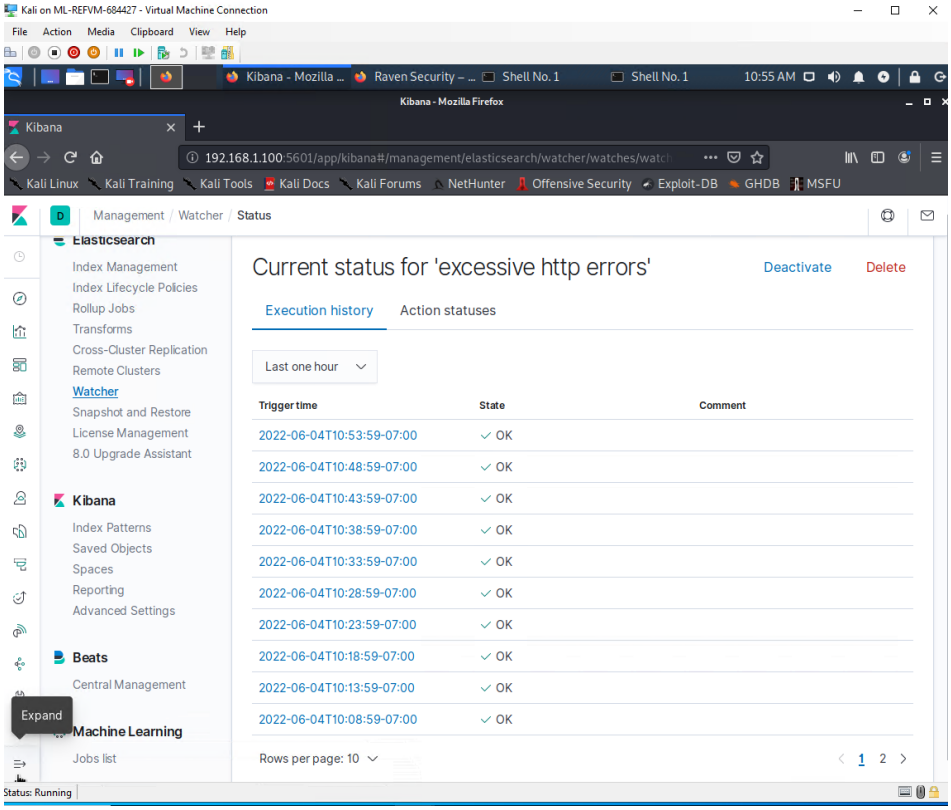
IS ABOVE 400

Vulnerability Mitigated:

Enumeration/Brute Force

Reliability:

The alert is highly reliable. Measuring by error codes 400 and above will filter out any normal or successful responses. 400+ codes are client and server errors which are of more concern. Especially when taking into account these error codes going off at a high rate.



HTTP Request Size Monitor

HTTP Request Size Monitor is implemented as follows:

WHEN sum() of http.request.bytes OVER all documents IS ABOVE 3500 FOR THE LAST 1 minute

Metric:

WHEN sum() of http.request.bytes OVER all documents

Threshold:

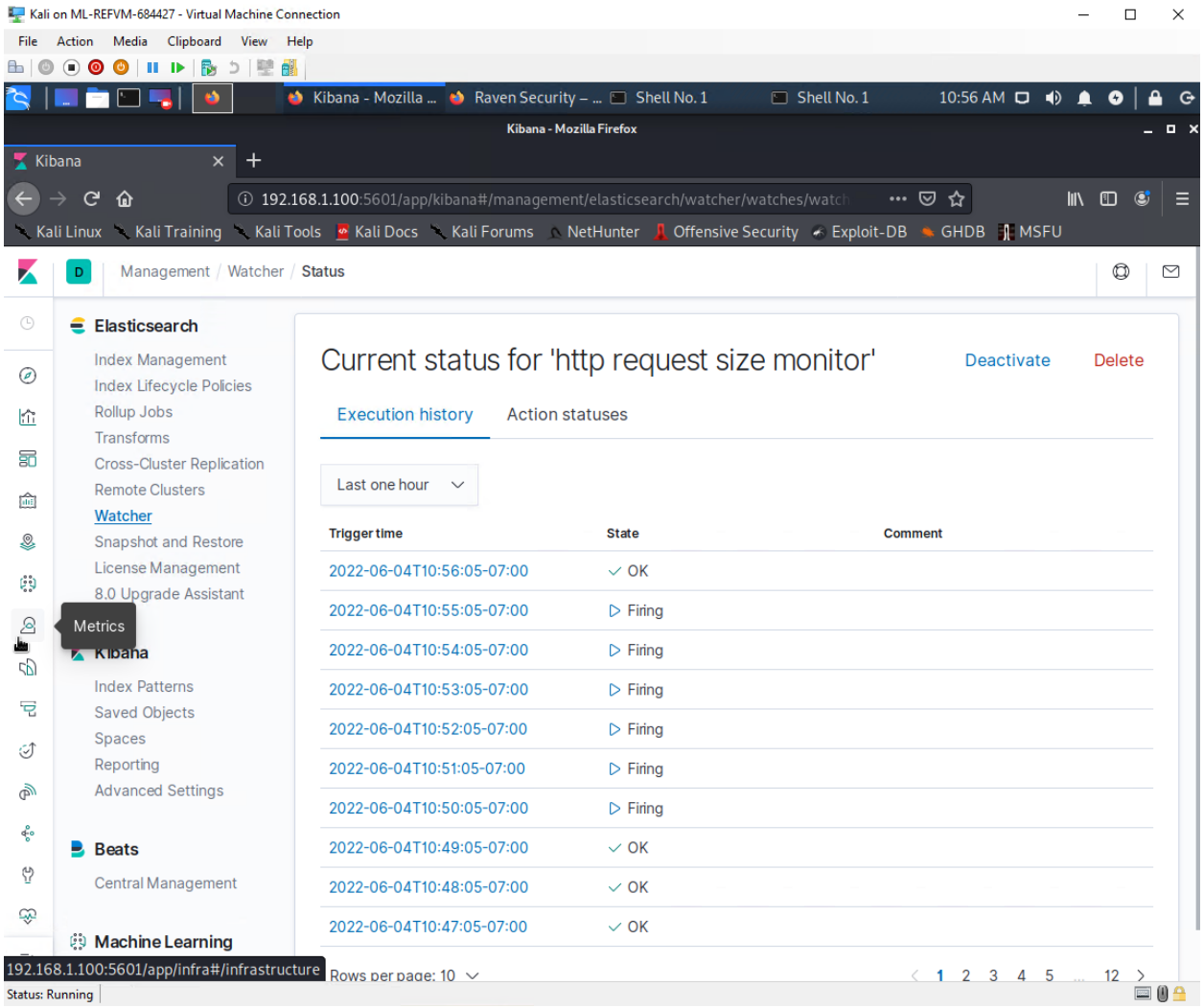
IS ABOVE 3500

Vulnerability Mitigated:

Code injection in HTTP requests (XSS and CRLF) or DDOS

Reliability:

Alert could create false positives. It comes in at medium reliability. There is a possibility for a large non malicious HTTP request or legitimate HTTP traffic.



CPU Usage Monitor

CPU Usage Monitor is implemented as follows:

WHEN max() OF system.process.cpu.total.pct OVER all documents IS ABOVE 0.5 FOR THE LAST 5 minutes

Metric:

WHEN max() OF system.process.cpu.total.pct OVER all documents

Threshold:

IS ABOVE 0.5

Vulnerability Mitigated:

Malicious software, programs (malware or viruses) running taking up resources

Reliability:

The alert is highly reliable. Even if there isn't a malicious program running this can still help determine where to improve on CPU usage.