

# Project 2 - Analyze Network Traces

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## Question 1: Network Topology Reconstruction

Tools : 1) Wireshark - for retrieving IP addresses from the PCAP files  
CLI Version of it. - tshark

2) PcapViz was used to create graphs from the PCAP files (which internally uses GraphViz and Scapy to create graphs)  
<https://github.com/mateuszk87/PcapViz>

Experimental: 1) Used Wireshark to retrieve all the IP Addresses in the traffic  
2) Editcap used to split the cap files into smaller ones for ease of use  
3) Applied Bash scripts on the output to get the unique hosts  
4) Taking into consideration that most of the connections are from TCP, SYN flag set was taken to be attackers, and SYN ACK flags taken to be defenders

Editcap :

```
editcap -c 1000000 myTest.pcap myTestout.pcap
```

Unique hosts:

```
tshark -r myTest.pcap -T fields -e ip.src -e ip.dst | tr "\t" "\n" | sort  
| uniq
```

Attackers :

```
tshark -r myTest.pcap -T fields -e ip.src tcp.flags eq 0x2 | tr "\t" "\n"  
| sort | uniq > Attackers.txt
```

Defenders :

```
tshark -r myTest.pcap -T fields -e ip.src tcp.flags eq 0x12 | tr "\t"  
"\n" | sort | uniq > Defenders.txt
```

For the classification, Red team named as attacker .

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| 10.10.0.7    |  |
| 10.10.9.109  |  |
| 10.10.9.12   |  |
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| 10.20.250.49 |  |
| 10.21.6.40   |  |

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| <b>10.51.17.10</b>    |  |
| <b>10.61.9.10</b>     |  |
| <b>10.7.136.109</b>   |  |
| <b>10.7.136.159</b>   |  |
| <b>10.7.136.63</b>    |  |
| <b>10.7.137.108</b>   |  |
| <b>109.201.131.11</b> |  |
| <b>110.209.6.25</b>   |  |
| <b>111.221.74.12</b>  |  |
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| <b>111.221.74.38</b>  |  |
| <b>111.221.77.140</b> |  |
| <b>111.221.77.141</b> |  |
| <b>111.221.77.143</b> |  |
| <b>111.221.77.145</b> |  |
| <b>111.221.77.146</b> |  |
| <b>111.221.77.147</b> |  |

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| <b>111.221.77.159</b>  |  |
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| <b>111.221.77.162</b>  |  |
| <b>111.221.77.165</b>  |  |
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| <b>128.59.20.141</b>   |  |
| <b>128.59.23.177</b>   |  |
| <b>137.56.163.64</b>   |  |
| <b>141.219.155.230</b> |  |
| <b>141.70.120.13</b>   |  |
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| <b>149.5.45.166</b>    |  |
| <b>149.9.0.58</b>      |  |
| <b>154.35.32.5</b>     |  |
| <b>156.154.70.22</b>   |  |
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| <b>157.55.130.152</b>  |  |
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| 157.55.235.165 |  |
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| <b>157.56.52.37</b>  |  |
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| <b>17.171.4.24</b>   |  |
| <b>171.25.193.21</b> |  |
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| <b>172.16.7.100</b>  |  |
| <b>172.16.8.100</b>  |  |
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| <b>173.194.43.14</b> |  |

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| 173.194.43.6    |  |
| 173.194.43.7    |  |
| 173.194.43.8    |  |
| 173.194.43.9    |  |
| 173.204.218.6   |  |
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| 174.129.217.197 |  |
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| 188.40.98.54    |  |

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| <b>192.168.201.78</b>  |          |
| <b>192.168.202.1</b>   |          |
| <b>192.168.202.10</b>  | Defender |
| <b>192.168.202.100</b> | Attacker |
| <b>192.168.202.101</b> | Attacker |
| <b>192.168.202.102</b> | Attacker |
| <b>192.168.202.103</b> | Attacker |
| <b>192.168.202.105</b> |          |
| <b>192.168.202.106</b> |          |
| <b>192.168.202.107</b> | Attacker |
| <b>192.168.202.108</b> | Attacker |
| <b>192.168.202.109</b> | Attacker |
| <b>192.168.202.110</b> | Attacker |
| <b>192.168.202.111</b> |          |
| <b>192.168.202.112</b> | Attacker |
| <b>192.168.202.113</b> | Attacker |
| <b>192.168.202.114</b> |          |
| <b>192.168.202.115</b> | Attacker |
| <b>192.168.202.116</b> |          |

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| 192.168.202.65  | Attacker |
| 192.168.202.67  |          |
| 192.168.202.68  | Attacker |
| 192.168.202.69  | Defender |
| 192.168.202.71  |          |
| 192.168.202.72  |          |
| 192.168.202.73  | Attacker |
| 192.168.202.74  | Attacker |
| 192.168.202.75  |          |
| 192.168.202.76  | Attacker |
| 192.168.202.77  |          |
| 192.168.202.78  | Defender |
| 192.168.202.79  | Attacker |
| 192.168.202.80  |          |
| 192.168.202.81  | Attacker |
| 192.168.202.82  | Defender |
| 192.168.202.83  | Attacker |
| 192.168.202.84  | Attacker |
| 192.168.202.85  |          |
| 192.168.202.86  | Attacker |
| 192.168.202.87  | Attacker |
| 192.168.202.88  |          |
| 192.168.202.89  | Attacker |
| 192.168.202.90  | Attacker |
| 192.168.202.91  | Attacker |
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| 192.168.202.94  | Attacker |
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| 192.168.202.96  | Attacker |
| 192.168.202.97  | Attacker |
| 192.168.203.1   |          |
| 192.168.203.255 |          |
| 192.168.203.45  | Attacker |
| 192.168.203.61  | Attacker |
| 192.168.203.62  | Attacker |
| 192.168.203.63  |          |
| 192.168.203.64  |          |
| 192.168.204.1   |          |
| 192.168.204.255 |          |
| 192.168.204.45  | Attacker |
| 192.168.204.57  |          |
| 192.168.204.59  |          |
| 192.168.204.60  |          |
| 192.168.204.69  | Attacker |
| 192.168.204.70  | Attacker |
| 192.168.205.1   |          |
| 192.168.205.100 |          |
| 192.168.205.205 |          |
| 192.168.205.253 | Defender |
| 192.168.206.1   |          |
| 192.168.206.44  | Defender |
| 192.168.207.1   |          |
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| <b>192.168.23.101</b> | Defender |
| <b>192.168.23.102</b> | Defender |
| <b>192.168.23.103</b> | Defender |
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| <b>192.168.23.12</b>  |          |

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| <b>192.168.23.203</b> | Defender |

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| <b>192.168.24.101</b> | Defender |
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| <b>192.168.24.25</b>  | Defender |
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| <b>192.168.24.251</b> |          |
| <b>192.168.24.252</b> | Defender |



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| <b>192.168.24.253</b> | Defender |
| <b>192.168.24.254</b> | Defender |
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| <b>192.168.26.101</b> | Defender |
| <b>192.168.26.102</b> | Defender |
| <b>192.168.26.103</b> | Defender |
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| <b>192.168.27.101</b> | Defender |
| <b>192.168.27.102</b> | Defender |
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| <b>192.168.28.101</b> | Defender |
| <b>192.168.28.102</b> | Defender |
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| <b>192.168.28.248</b> |          |
| <b>192.168.28.249</b> |          |
| <b>192.168.28.25</b>  | Defender |

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| 192.168.28.251 |          |
| 192.168.28.252 | Defender |
| 192.168.28.253 | Defender |
| 192.168.28.254 | Defender |
| 192.168.28.255 |          |
| 192.168.28.26  |          |
| 192.168.28.27  |          |
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| 195.46.253.211  |  |
| 195.71.226.87   |  |
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| 198.153.194.1   |  |
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| 199.7.51.190    |  |
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| 199.7.71.72     |  |
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| 204.45.29.132   |  |
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| 204.9.163.143   |  |
| 205.247.221.42  |  |

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| <b>208.29.69.216</b>   |  |
| <b>209.15.238.254</b>  |  |
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| <b>213.185.227.85</b>  |  |
| <b>213.199.179.140</b> |  |
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| 68.87.75.198   |  |
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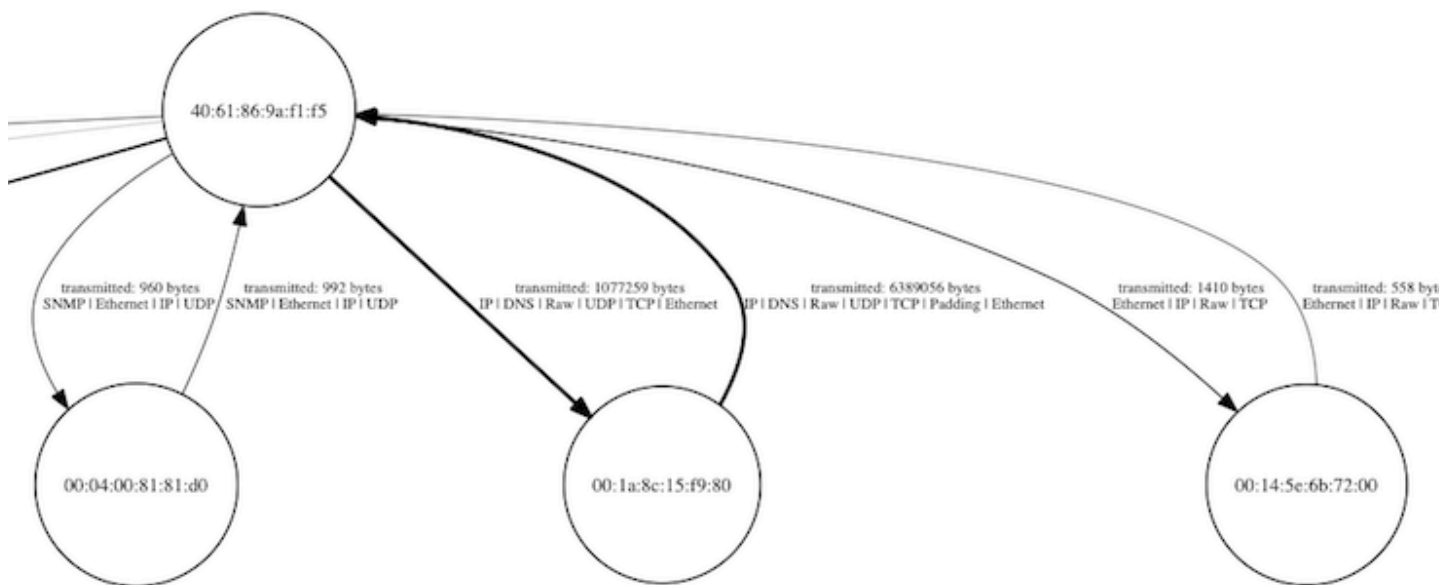


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| 94.75.228.29  |  |
| 95.79.25.114  |  |
| 96.6.171.141  |  |
| 97.74.177.128 |  |

### For creating graphs from the pcap files:

PcapViz was used, although the file size was huge that the process didn't end in time. Following are the screenshots for smaller test files and how the graphs might look



**FIG 1.1: SCREENSHOT OF SAMPLE GRAPH USED IN PCAPVIZ**

## Question 2: Network Traffic Graphs

**Tools :**

- 1) Bro : For extracting all the log files for each protocol
- 2) bro-cut : For formatting the log's date in Epoch to human readable form
- 3) Splunk : Feeding the log files in the tool and analysing the data, turn them into visualisations

### Experimental :

1) Using Bro, log files were extracted and stored

```
bro -r myTest.pcap
```

2) Bro logs were reformatted to get in human readable time format using *bro-cut*

```
bro-cut -d < http.log
```

3) Fed data into Splunk App for further analysis and graphs.

4) Following data were extracted using the queries given.

### Data:

The graphs can also be viewed at

<https://prd-p-3xhw96qr3ll7.cloud.splunk.com/en-GB/app/search/brologscaptured>

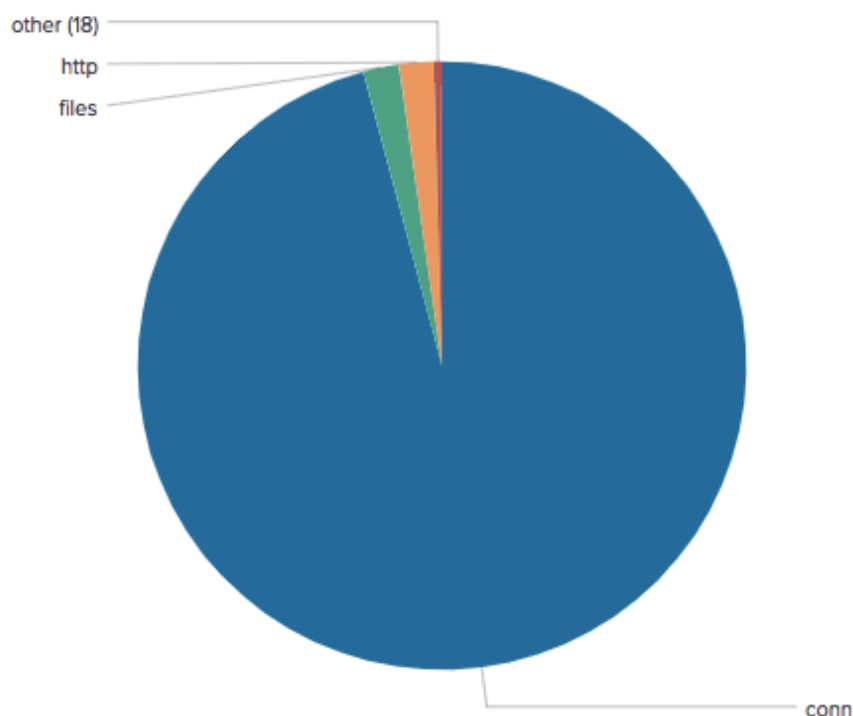
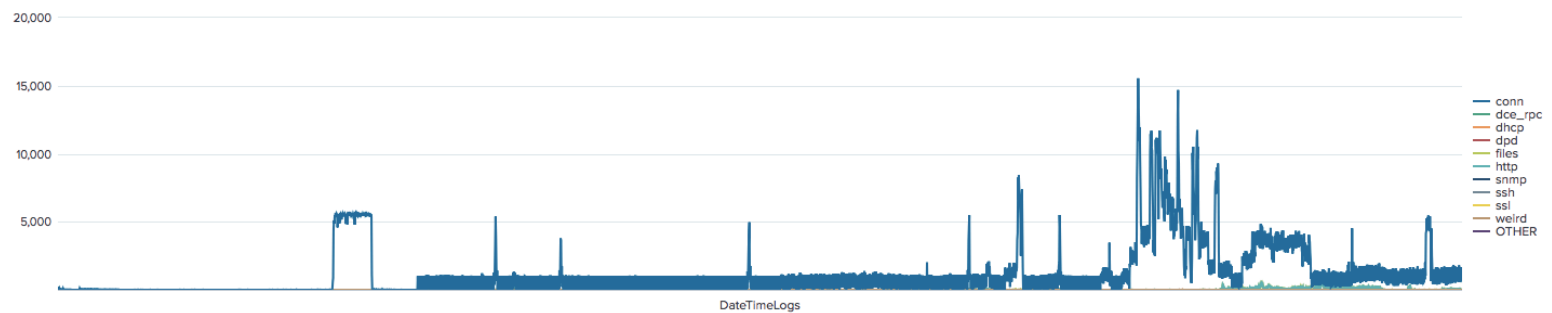
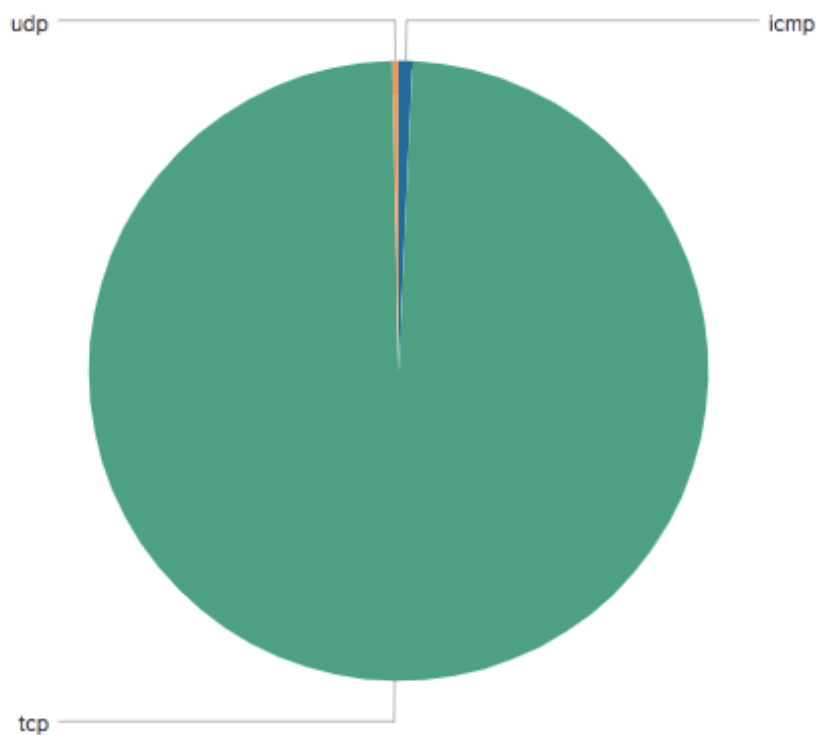


FIG 2.1 : DISTRIBUTION OF PROTOCOLS OVER ALL TIME

Query used : `index="ctf_logs_analysis" | chart count over DateTimeLogs by sourcetype`



**FIG 2.2 : DISTRIBUTION OF PROTOCOLS AS A TIME CHART**



**FIG 2.3 : DISTRIBUTION OF INTERNET PROTOCOLS**

**Future work :**

- 1) Continuing the same method for live data

## Question 3 : Attack Identification and Extraction

### Tools:

- 1) Wireshark
- 2) Splunk

### Experimental:

- 1) Splunk : The already created graphs on Splunk are used to see the peaks in connection logs where the number of packets transferred are highest
- 2) Wireshark : The date, time from Splunk logs used to check against Wireshark

### Data:

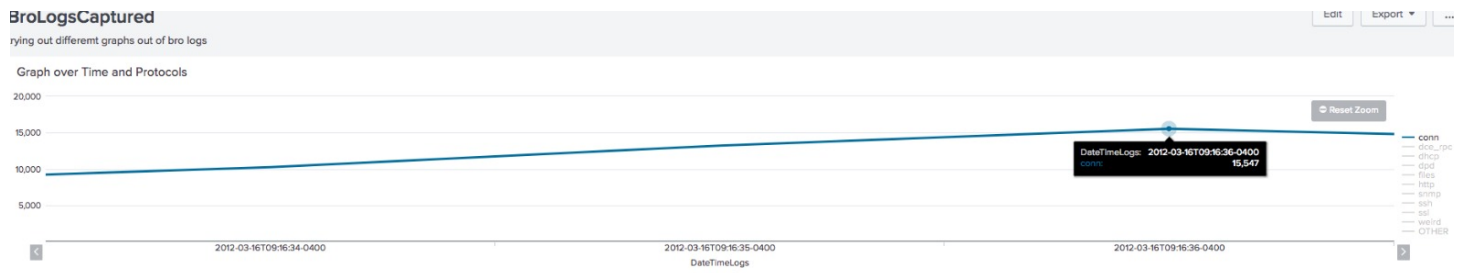
#### 1) DoS attack:

#### CVE-1999-0116

*'Denial of service when an attacker sends many SYN packets to create multiple connections without ever sending an ACK to complete the connection, aka SYN flood.'*

The highest peak in the graph is seen as follows:

Occurring at 9:16:36 , 2012-03-16 :



**FIG 3.1 : HIGHEST PEAK IN TRANSFER OF CONNECTION PACKETS**

Referring over Wireshark at that Pcap file :

|   |          |                 |                 |     |    |               |   |
|---|----------|-----------------|-----------------|-----|----|---------------|---|
| 1   | 0.000000 | 192.168.202.110 | 192.168.27.1    | TCP | 66 | 28116 → 29537 | [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=  |
| 2   | 0.000000 | 192.168.202.110 | 192.168.27.1    | TCP | 66 | 14418 → 29590 | [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=  |
| 3   | 0.000000 | 192.168.202.110 | 192.168.27.1    | TCP | 66 | 7080 → 29643  | [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1 |
| 4   | 0.000000 | 192.168.202.110 | 192.168.27.1    | TCP | 66 | 49720 → 29696 | [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=  |
| 5   | 0.000000 | 192.168.202.110 | 192.168.27.1    | TCP | 66 | 61343 → 29749 | [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=  |
| 6   | 0.000000 | 192.168.204.45  | 192.168.21.100  | TCP | 64 | 39436 → 14812 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 7   | 0.000000 | 192.168.204.45  | 192.168.21.101  | TCP | 64 | 39436 → 56502 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 8   | 0.000000 | 192.168.204.45  | 192.168.21.25   | TCP | 64 | 39436 → 31757 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 9   | 0.000000 | 192.168.204.45  | 192.168.21.100  | TCP | 64 | 39436 → 17604 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 10  | 0.000000 | 192.168.204.45  | 192.168.21.101  | TCP | 64 | 39436 → 33063 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 11  | 0.000000 | 192.168.204.45  | 192.168.21.25   | TCP | 64 | 39436 → 31091 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 12  | 0.000000 | 192.168.204.45  | 192.168.21.100  | TCP | 64 | 39436 → 27401 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 13  | 0.000000 | 192.168.204.45  | 192.168.21.101  | TCP | 64 | 39436 → 39858 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 14  | 0.000000 | 192.168.204.45  | 192.168.21.25   | TCP | 64 | 39436 → 23529 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 15  | 0.000000 | 192.168.204.45  | 192.168.21.100  | TCP | 64 | 39436 → 18323 | [SYN] Seq=0 Win=1024 Len=0 MSS=1460             |
| 16  | 0.000000 | 192.168.27.1    | 192.168.202.110 | TCP | 64 | 15969 → 35249 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 17  | 0.000000 | 192.168.27.1    | 192.168.202.110 | TCP | 64 | 16022 → 20944 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 18  | 0.000000 | 192.168.27.1    | 192.168.202.110 | TCP | 64 | 16075 → 13305 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 19  | 0.010000 | 192.168.21.100  | 192.168.204.45  | TCP | 64 | 14812 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 20  | 0.010000 | 192.168.21.101  | 192.168.204.45  | TCP | 64 | 56502 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 21  | 0.010000 | 192.168.21.101  | 192.168.204.45  | TCP | 64 | 33063 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 22  | 0.010000 | 192.168.21.100  | 192.168.204.45  | TCP | 64 | 17604 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 23  | 0.010000 | 192.168.21.25   | 192.168.204.45  | TCP | 64 | 31757 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 24  | 0.010000 | 192.168.21.25   | 192.168.204.45  | TCP | 64 | 31091 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 25  | 0.010000 | 192.168.21.100  | 192.168.204.45  | TCP | 64 | 27401 → 39436 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| 26  | 0.010000 | 192.168.27.25   | 192.168.202.110 | TCP | 64 | 28649 → 18507 | [RST, ACK] Seq=1 Ack=1 Win=0 Len=0              |
| Arrival Time: Mar 16, 2012 09:16:36.590000000 EDT |          |                 |                 |     |    |               |   |

FIG 3.2: WIRESHARK SCREENSHOT DEPICTING THE DOS ATTACK

- The Red Team has tried to flood with SYN packets

## 2) Unauthorised Login attempt:

|       |          |                 |                 |      |      |   |
|-------|----------|-----------------|-----------------|------|------|---|
| 3453  | 0.180000 | 192.168.28.203  | 192.168.202.102 | TCP  | 1438 | 8080 → 4410 [ACK] Seq=1 Ack=725 Win=295 Len=1380 [TCP segment of a reassembled PDU]       |
| 3454  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 60721 → 12920 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                             |
| 3455  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 51376 → 12973 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                             |
| 3456  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 1036 → 13026 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                              |
| 3457  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 23005 → 13079 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                             |
| 3458  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 1684 → 13132 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                              |
| 3459  | 0.180000 | 192.168.28.203  | 192.168.202.102 | TCP  | 1438 | 8080 → 4410 [ACK] Seq=1381 Ack=725 Win=295 Len=1380 [TCP segment of a reassembled PDU]    |
| 3460  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 33447 → 13185 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                             |
| 3461  | 0.180000 | 192.168.202.110 | 192.168.27.1    | TCP  | 66   | 15815 → 13238 [SYN] Seq=0 Win=4096 Len=0 MSS=1460 SACK_PERM=1                             |
| 3462  | 0.180000 | 192.168.28.203  | 192.168.202.102 | TCP  | 68   | 8080 → 4410 [PSH, ACK] Seq=2761 Ack=725 Win=295 Len=10 [TCP segment of a reassembled PDU] |
| 3463  | 0.180000 | 192.168.21.25   | 192.168.204.45  | TCP  | 64   | 30674 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3464  | 0.180000 | 192.168.21.100  | 192.168.204.45  | TCP  | 64   | 37471 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3465  | 0.180000 | 192.168.21.100  | 192.168.204.45  | TCP  | 64   | 64237 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3466  | 0.180000 | 192.168.21.101  | 192.168.204.45  | TCP  | 64   | 24767 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3467  | 0.180000 | 192.168.21.101  | 192.168.204.45  | TCP  | 64   | 59972 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3468  | 0.180000 | 192.168.21.25   | 192.168.204.45  | TCP  | 64   | 60301 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3469  | 0.180000 | 192.168.21.25   | 192.168.204.45  | TCP  | 64   | 42036 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3470  | 0.180000 | 192.168.21.100  | 192.168.204.45  | TCP  | 64   | 44061 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3471  | 0.180000 | 192.168.202.102 | 192.168.28.203  | TCP  | 64   | 4410 → 8080 [ACK] Seq=725 Ack=2771 Win=64240 Len=0  |
| 3472  | 0.180000 | 192.168.21.101  | 192.168.204.45  | TCP  | 64   | 21978 → 39436 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 3473  | 0.180000 | 192.168.27.1    | 192.168.202.110 | TCP  | 64   | 65365 → 63024 [RST, ACK] Seq=1 Ack=1 Win=0 Len=0  |
| 34... | 0.180000 | 192.168.28.203  | 192.168.202.102 | HTTP | 67   | HTTP/1.1 401 Unauthorized (text/html)   |

```

</style>\n
</head>\n
<body>\n
<h1>401 Unauthorized</h1>\n
<p>\n
You are not authorized to view this page. If you have not changed\n
any configuration files, please examine the file\n
<tt>conf/tomcat-users.xml</tt> in your installation. That\n
file must contain the credentials to let you use this webapp.\n
</p>\n
<p>\n
For example, to add the <tt>manager-gui</tt> role to a user named\n
<tt>tomcat</tt> with a password of <tt>s3cret</tt>, add the following to the\n
config file listed above.\n
</p>\n

```

FIG 3.3 : WIRESHARK SCREENSHOT OF UNAUTHORISED HTTP LOGIN

- An unauthorised HTTP Login has been attempted **by 192.168.202.02 on 192.168.28.203**
- **192.168.28.203** has replied back with an html page redirecting it to login with the credentials provided

### 3) SQL Injection :

**CVE-2017-15974** (A closer match to the found SQL Injection )

'SQL Injection has been performed on hosts by adding UNION SELECT and having 1=1 clause'

Search query :

```
index="ctf_logs_analysis" sourcetype="http" select having  
Source="192.168.202.110"
```

Search results can also be found at :

<https://prd-p-3xhw96qr3ll7.cloud.splunk.com/en-GB/app/search/brologscaptured>

**splunk® cloud** App: Search & Reporting ▾ Messages ▾ Settings ▾ Activity ▾ Find 🔍

Prashanthi Kannappen Murthy ▾ My Splunk ▾ Support & Services ▾

---

**Search** Datasets Reports Alerts Dashboards **> Search & Reporting**

---

## New Search Save As ▾ New Table Close

index="ctf\_logs\_analysis" sourcetype="http" select having Source="192.168.202.110"

✓ 37 events (before 10/16/18 9:48:38.000 PM) No Event Sampling ▾ Job ▾ || ■ ↺ ⌂ ⬇️ ⚙️ Smart Mode ▾

Events (37) Patterns Statistics Visualization

Format Timeline ▾ — Zoom Out + Zoom to Selection × Deselect 1 minute per column

List ▾ Format 50 Per Page ▾

|  | i | Time                       | Event  |
|--|---|----------------------------|--|
| <b>SELECTED FIELDS</b><br># host 1<br># source 1<br># sourcetype 1 | > | 11/23/14<br>1:30:04.000 PM | 2012-03-16T09:38:04-0400 C7mGAPIm35nfIn34p1 192.168.202.110 58995 192.168.27.101 80 1 GET 192.168.27.101 /insertorder.cfm?CFID=1&CFTOKEN=1 UNION SELECT 1,2,3,4,storename,6,7,8<br>,9,10,11,12,13,14,15 from Params'having l=1 - 1.1 Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 5.1; Trident/4.0) 0 238 484 NOT FOUND - - (empty) -<br>- - FBMLgj2y9GuqYwQt1 - text/html<br>host = prd-p-3xhw96qr3lI7   source = new_httplog   sourcetype = http          |
|  | > | 11/23/14<br>1:30:04.000 PM | 2012-03-16T09:38:04-0400 CIIXkz03NkUPKEBuwe7 192.168.202.110 58990 192.168.27.101 80 1 GET 192.168.27.101 /cgi-bin/insertorder.cfm?CFID=1&CFTOKEN=1 UNION SELECT 1,2,3,4,storena<br>me,6,7,8,9,10,11,12,13,14,15 from Params'having l=1 - 1.1 Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 5.1; Trident/4.0) 0 238 484 NOT FOUND - - (empty) -<br>- - FLUTXLaJ38kvOFVcl - text/html<br>host = prd-p-3xhw96qr3lI7   source = new_httplog   sourcetype = http |
|  | > | 11/23/14<br>1:30:03.000 PM | 2012-03-16T09:38:03-0400 CBL3wL2EAFKcCVIYZk 192.168.202.110 58984 192.168.27.101 80 1 GET 192.168.27.101 /scripts/insertorder.cfm?CFID=1&CFTOKEN=1 UNION SELECT 1,2,3,4,storena<br>me,6,7,8,9,10,11,12,13,14,15 from Params'having l=1 - 1.1 Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 5.1; Trident/4.0) 0 238 484 NOT FOUND - - (empty) -<br>- - FXqeCXdcPNGGwIfsd - text/html<br>host = prd-p-3xhw96qr3lI7   source = new_httplog   sourcetype = http  |
|  | > | 11/23/14<br>1:26:41.000 PM | 2012-03-16T09:26:41-0400 CAPlyh2IIDwHvHUj181 192.168.202.110 53197 192.168.27.203 8080 1 GET 192.168.27.203 /insertorder.cfm?CFID=1&CFTOKEN=1 UNION SELECT 1,2,3,4,storename,6,7,8<br>,9,10,11,12,13,14,15 from Params'having l=1 - 1.1 Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 5.1; Trident/4.0) 0 1000 484 Not Found - - (empty) -<br>- - FZywTlqpUOdKZ19c - text/html<br>host = prd-p-3xhw96qr3lI7   source = new_httplog   sourcetype = http       |

**INTERESTING FIELDS**  
# CFID 1  
# CFTOKEN 1  
# date\_hour 1  
# date\_mday 1  
# date\_minute 3  
# date\_month 1  
# date\_second 4  
# date\_wday 1  
# date\_year 1  
# date\_zone 1  
# DateTimeLogs 4  
# Destination 3

### FIG 3.4 : SQL INJECTION AS SHOWN IN SPLUNK



## Question 4: Interesting Findings:

### Tools:

- 1) Wireshark
- 2) Splunk

### Experimental:

- 1) Splunk : The already created graphs on Splunk are used to see the peaks in connection logs where the number of packets transferred are highest
- 2) Wireshark : The date, time from Splunk logs used to check against Wireshark

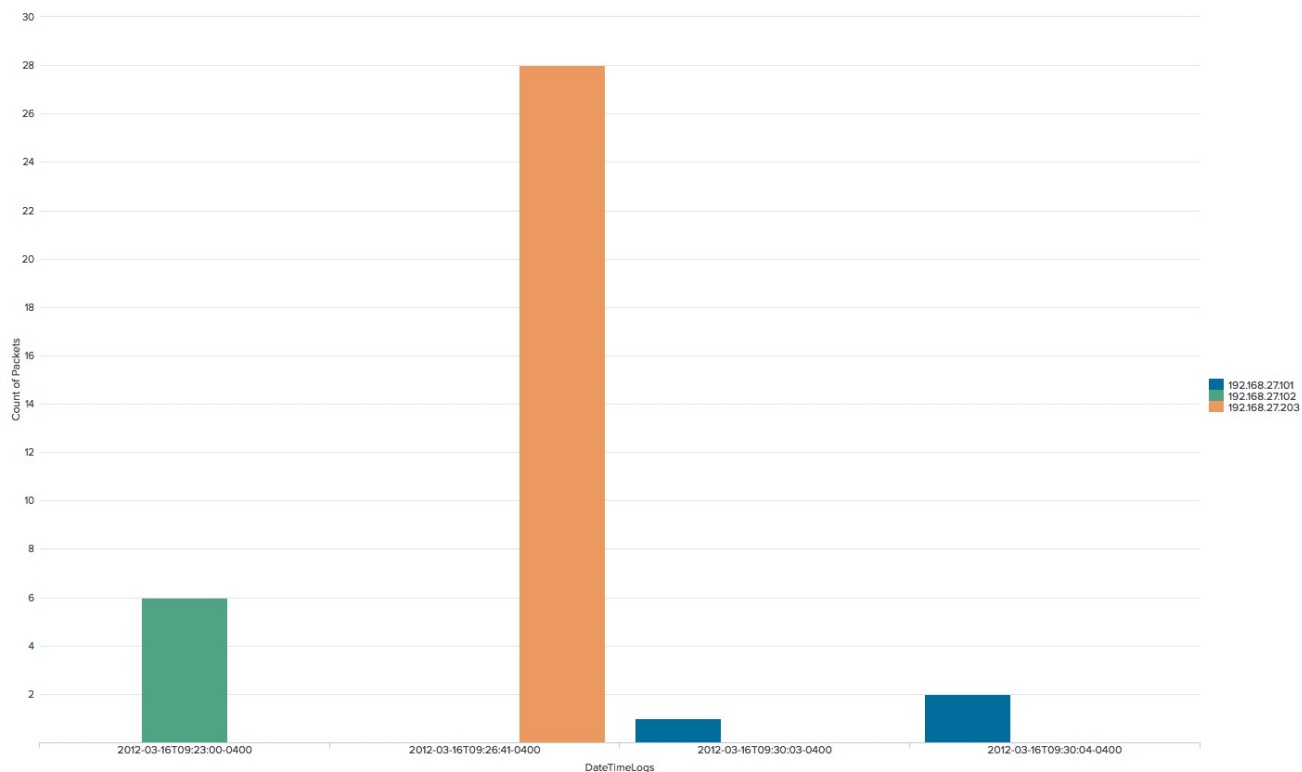
### Data & Discussion :

- 1) Data : Findings on DoS Attack:
  - 1) The SYN Flooding has majorly come from *192.168.202.110* , *192.168.204.45* for the DoS attack.
  - 2) Defence carried out :Competitors have responded with [RST,ACK] discontinuing the TCP connection set.
  - 3) The time range in which it was carried out *9:16:37 - 9:19:57* , Throughout the time range SYN flags were flooded from the hosts specified.



FIG 4.1 : RANGE HITTING PEAKS DURING THE SPECIFIED TIMINGS

- 2) Data : Findings on SQL Injection Attack :
  - 1) The SQL Injection was carried out by **192.168.202.110**
  - 2) This time, it was carried out on three hosts :
    - 198.168.27.203
    - 198.168.27.102
    - 198.168.27.101
  - 3) Time span over which the attacks were carried out were coloured by Destination ports:



**FIG 4.2: DISTRIBUTION OF PACKET COUNT OVER TIME RANGE COLOURED BY DESTINATION PORT**

## Appendix:

Network Pcap File :

**[maccdc-2012/maccdc2012\\_00000.pcap.gz](#)**  
 (Link followed downloads the pcap file)

Splunk Graphs :

All the graphs depicted in the file can be found on Splunk's cloud version available in the below link :

**Bro Logs loaded on Splunk**

Note: An account on Splunk Cloud free trial is needed  
 Logs and dashboard are available only till 26 Oct 2018 (Free trial expiry)