Tracking DDoS Attacks
Insights into the Business of Disrupting the Web

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Botnets, Spyware, Worms, New Emerging Threats, and More

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usenix
THE ADVANCED COMPUTING SYSTEMS ASSOCIATION

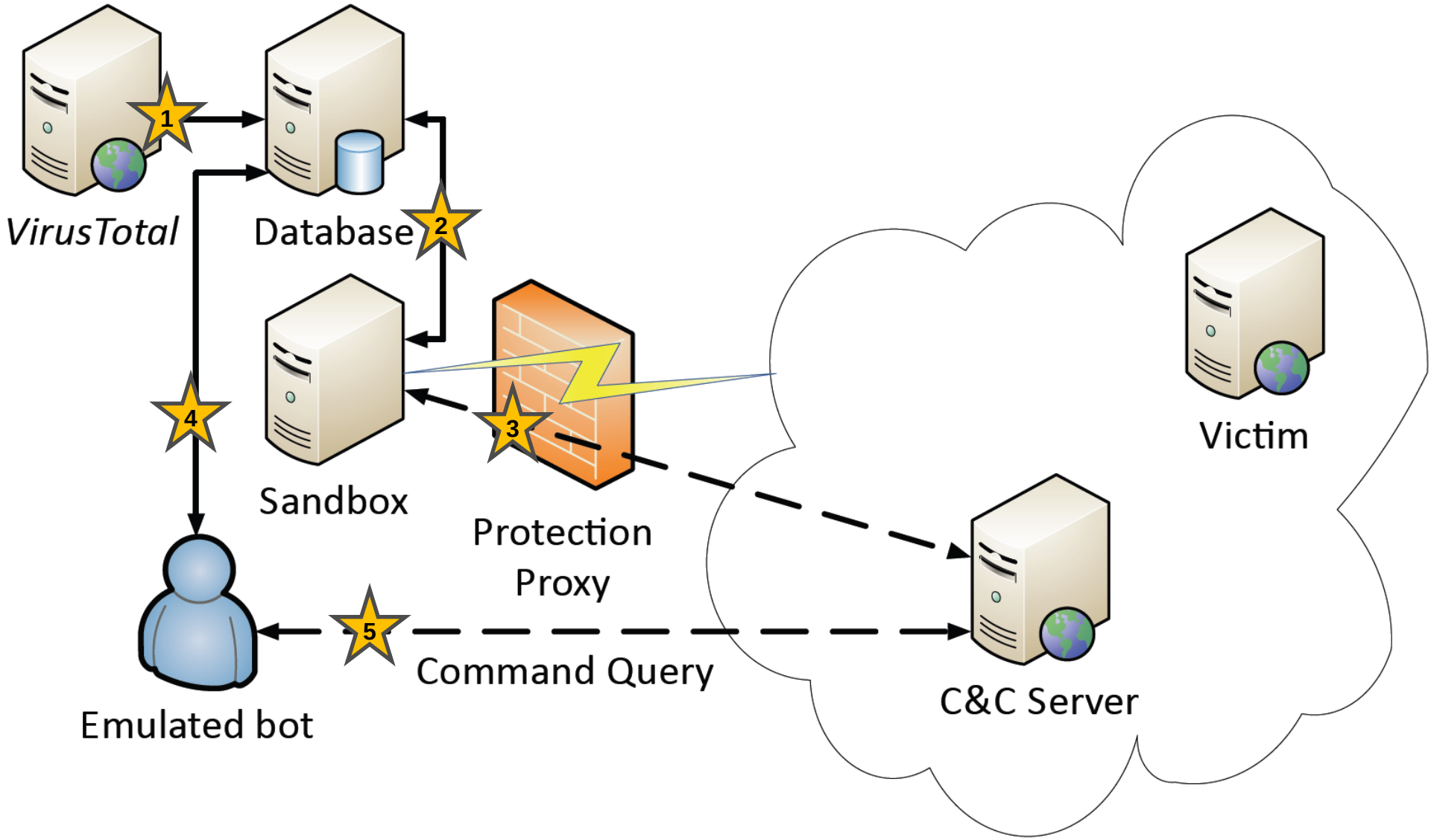
DDoS in today's Internet landscape

- Instruments
  - ***Botnets (Cybercrime)***
  - Volunteers (Hacktivism)
- Attacked technologies
  - Network layer
  - Transport layer
  - ***Application layer***
- Impacts of service downtime
  - Business - Revenue loss
  - Information - Silence

Motives for DDoS attacks

- Blackmail service operators
- Disrupt the competition
- Disrupt adversaries
- Manipulate services
- Political protest

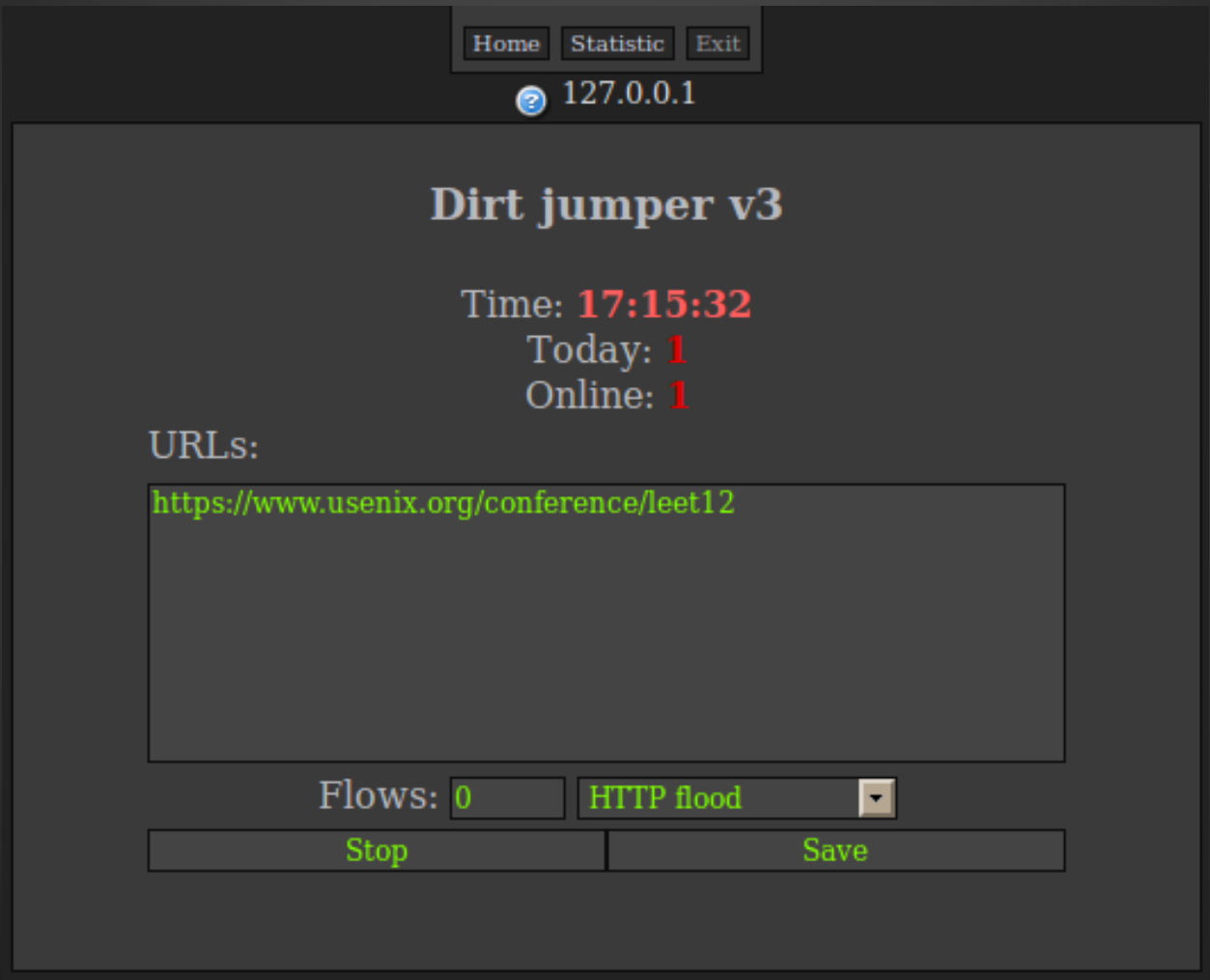
Automated C&C monitoring



Dirt Jumper (DJ)

- Crimeware Kit
  - Successor of ***Ruskill*** (2009) DDoS bot
  - Sold in Underground forums
  - Leaked/Pirated in Underground forums
  - Several versions:
    - ***DJ v1-v3***
    - ***DJ September***
    - ***DJ v5*** (first seen Oct 2011)
    - (***Pandora***)
  - Unencrypted C&C traffic

DJ Panel


Home
Statistic
Exit
127.0.0.1
Dirt jumper v3
Time: 17:15:32
Today: 1
Online: 1
URLs:
https://www.usenix.org/conference/leet12
Flows: 0
HTTP flood
Stop
Save

DJ C&C HTTP Request

```
POST /index.php HTTP/1.0
Host: ***C&C***.com
Keep-Alive: 300
Connection: keep-alive
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1)
Content-Type: application/x-www-form-urlencoded
Content-Length: 17

k=807789926667168
```

DJ C&C HTTP Response

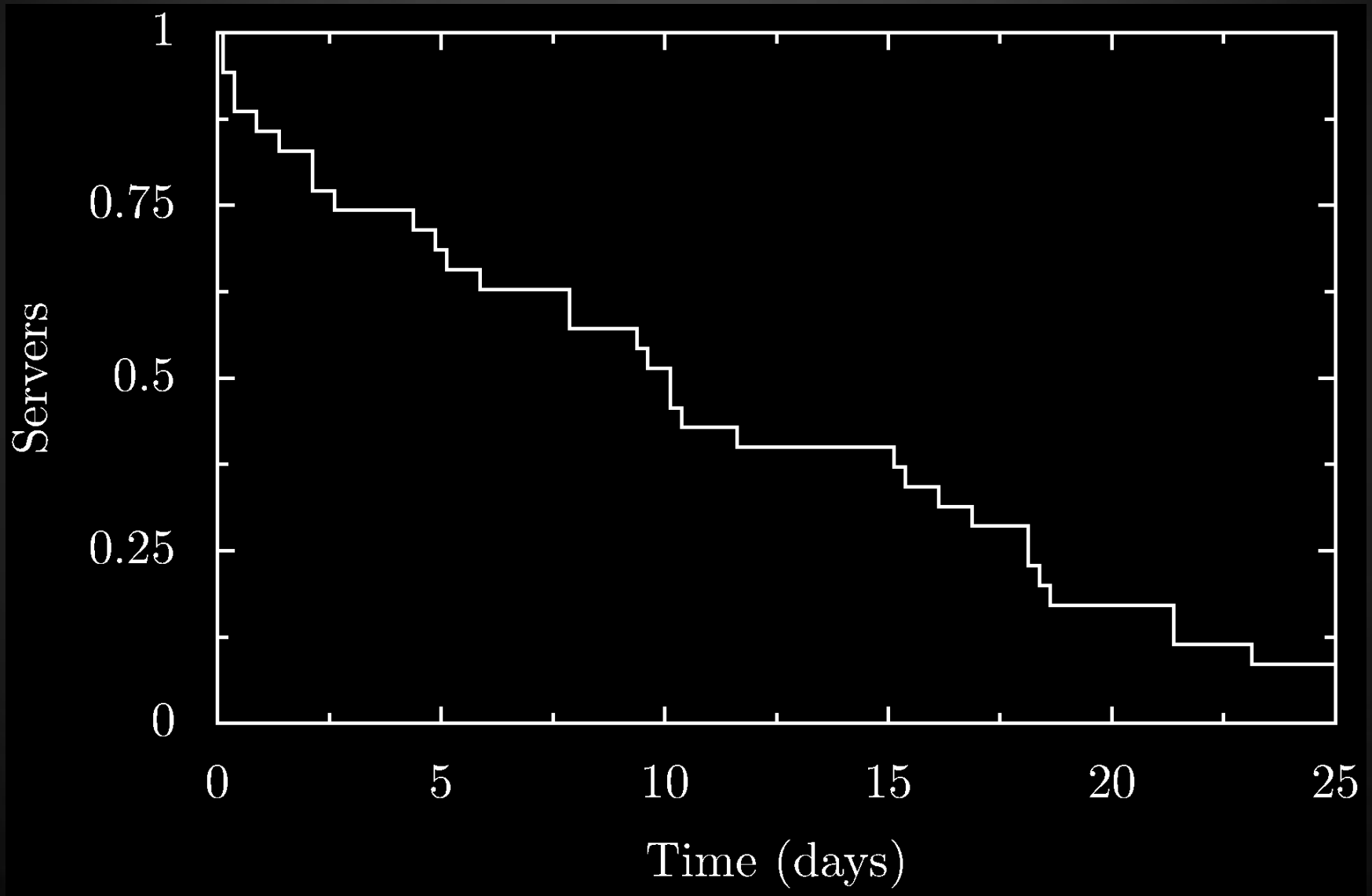
```
HTTP/1.1 200 OK
Date: Thu, 02 Feb 2012 21:33:48 GMT
Server: Apache
X-Powered-By: PHP/5.2.17
Vary: Accept-Encoding,User-Agent
Content-Length: 30
Connection: close
Content-Type: text/html

01|50|60http://***VICTIM***.com
```

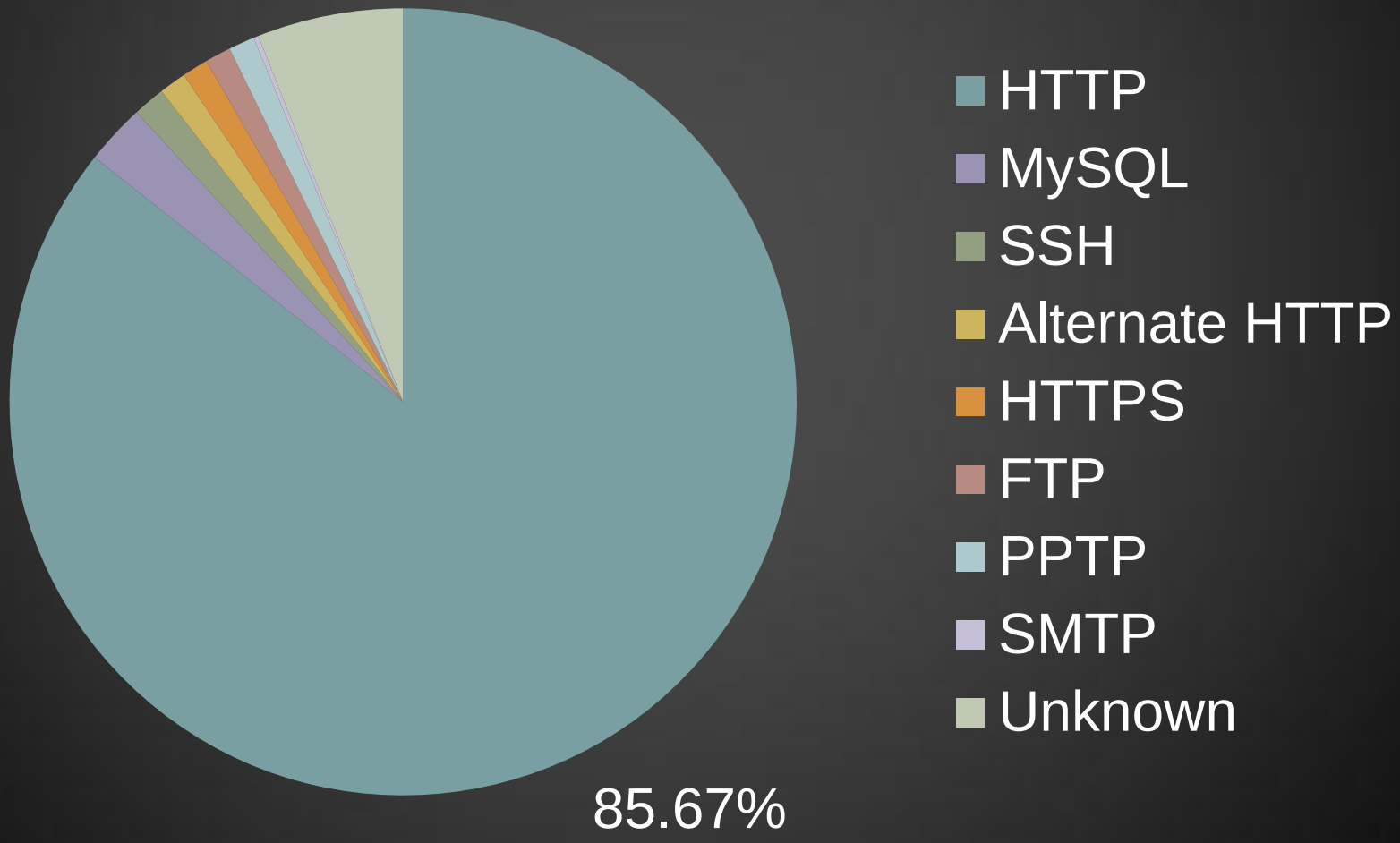
DJ Monitoring

- Monitoring C&C commands over four months (Oct '11 - Jan '12)
- Dirt Jumper malware sample set
  - 465 samples
  - 274 samples showed DJ C&C traffic
- 68 unique C&C URLs
  - 35 URLs responded at least once w. valid command
- 1,968 unique URL targets

DJ Monitoring - C&C Lifetime



DJ Monitoring - Services

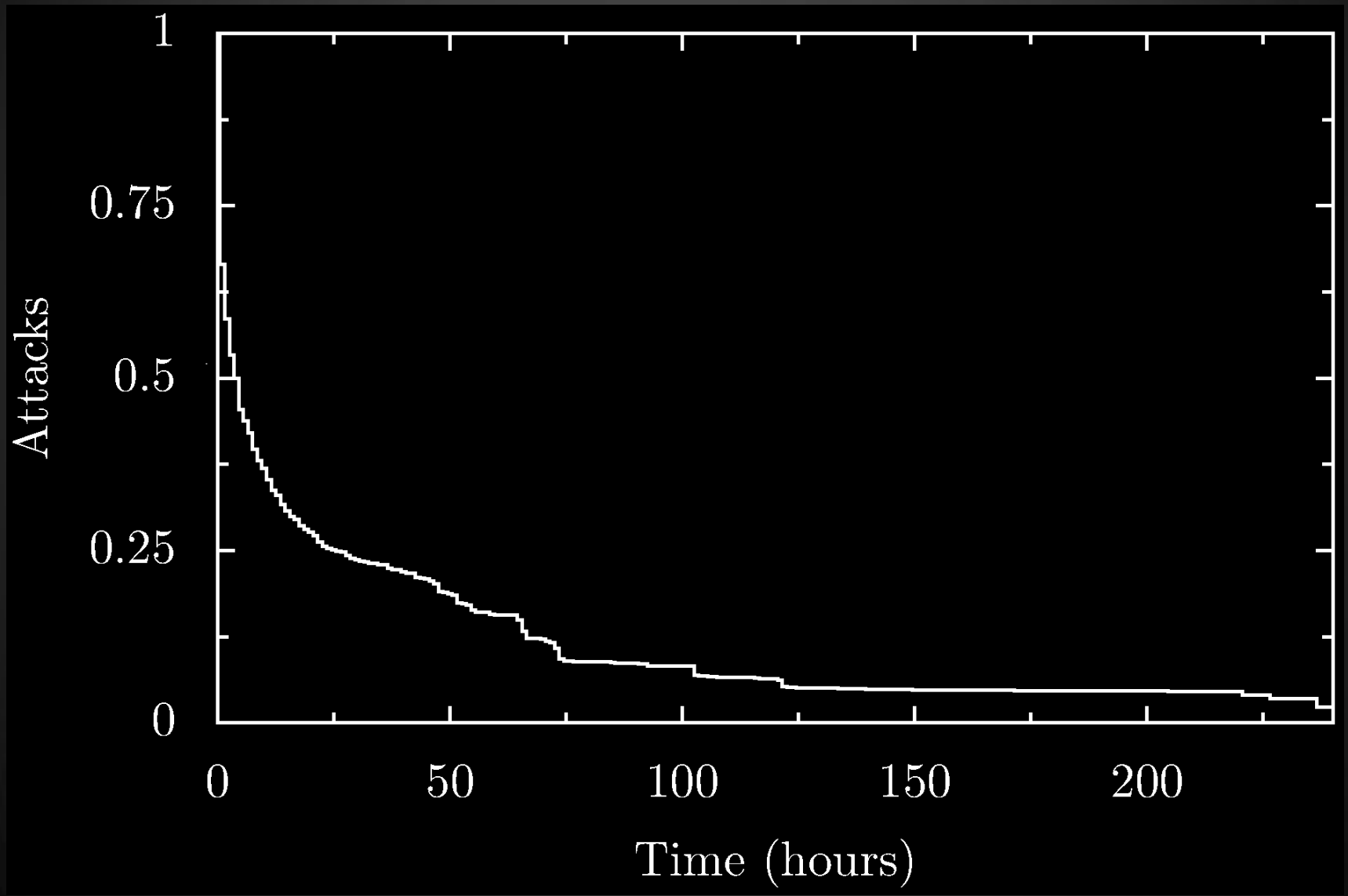


DJ Monitoring - Categories (WBSN)

DJ Monitoring - Financial

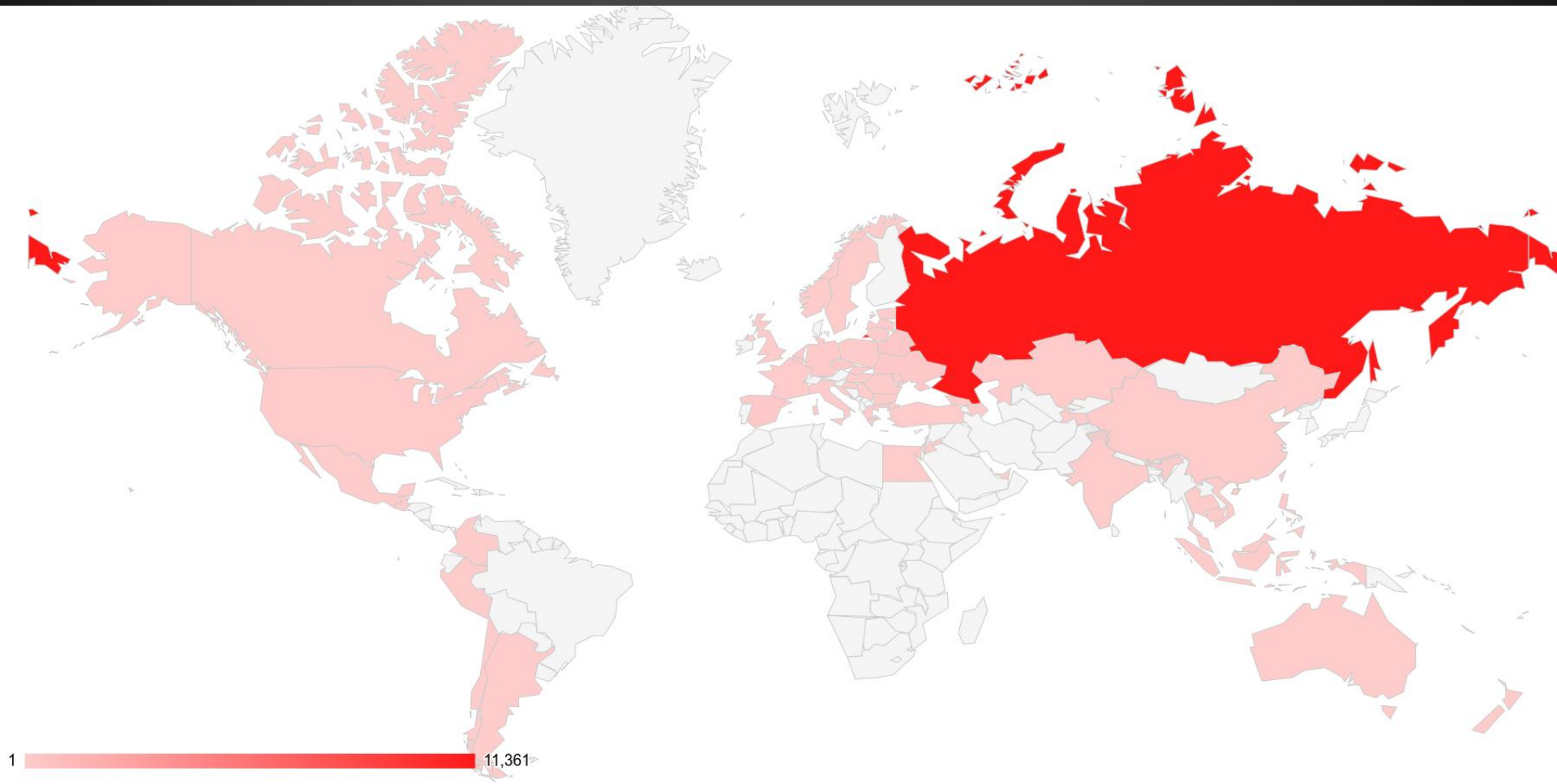
- 17 Online banking portals
- 9 Online stock brokerage portals
  - etrade.com.au
    - 5 day attack in December 2011

DJ Monitoring - Attack length



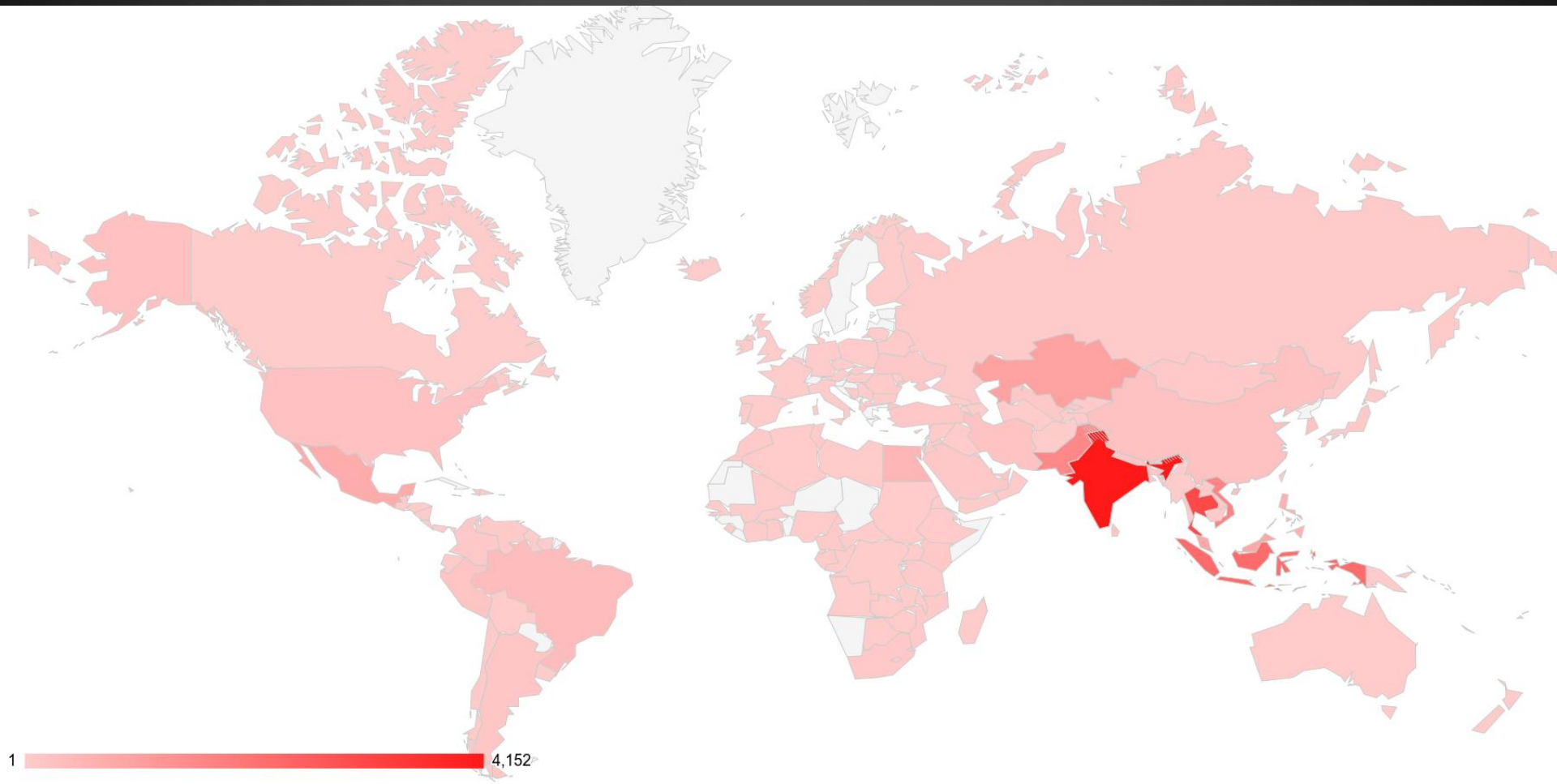
DJ Victim Logs - VirusTotal

- 12,686 unique IP addresses



DJ Victim Logs - Krebs on Security

- 21,293 unique IP addresses



Conclusion

- DDoS malware…
  - is readily available in the Underground
- DDoS botnets…
  - are used as a monetization strategy by Cybercriminals
  - can ruin Internet-centric businesses
  - are used to attack adversaries in the IT Security Community

Acknowledgments

- Francisco Santos, Julio Canto (Hispasec)
  - virustotal.com attack webserver logs
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  - krebsonsecurity.com attack webserver logs
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  - Curt Wilson (Arbor Networks)
  - Shadowserver

Thank you!
Questions?