Internet Pollution – Part 2

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A Framework for Internet Pollution Analysis

- Work with RIRs to identify upcoming allocation
- Obtain LOA
- Advertise, Collect, Analyze, Archive, Provide to research community
- Cleanup/Quarantine recommendations
- Support from DHS via PREDICT Project
Cross RIR Darknet Traffic Analysis

• Goal: Analyze darknet traffic to determine how much and what kinds of pollution were present in each block and determine whether cleanup/quarantine were viable options
• 23/8, 100/8, 45/8 - ARIN
• 5/8, 37/8 - RIPE
• 105/8 – AfriNIC
• Several 7 day long datasets were collected – here we are presenting results from a 6 /8 collection with 3 simultaneous announcements (37, 45, 100)
• Alternate dataset has all 6 /8 announcements at the same time
Comparing Traffic Volumes

Synchronized Spikes
Comparing Hotspot Activity
Single /16 and single /24 account for majority of the captured traffic by byte count.
TCP – Dest Port 80, 445

UDP – Source Port 53

Top 20 TCP destination ports (by packets) to 37.0.0.0/8

Top 20 UDP source ports (by packets) to 37.0.0.0/8
• Port 80 TCP traffic all appears to be directed at single IP address and appears to be related with facebook blocking in china


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www.facebook.com. 11556 IN A 37.61.54.158
www.facebook.com. 24055 IN A 78.16.49.15
www.facebook.com. 38730 IN A 203.98.7.65
23/8

Top 20 UDP destination ports (by bytes) to 23.0.0.0/8

UDP Destination Port 3100

Top 20 UDP source ports (by bytes) to 23.0.0.0/8

UDP Source Port 1201
23/8

- Traffic from source port 1201 to dest port 3100 from single source to single destination
- Video stream – decoded to 1080p video!
Cumulative Distribution Function of Destination /24s in 100.0.0.0/8

Hot-Spotting
100/8

Top 10 /16s in 100/8

Traffic (Gigabytes)

Subnet (/16)

Top 10 /24s in 100/8

Traffic (Gigabytes)

Subnet (/24)
100/8

Top 20 TCP destination ports (by packets) to 100.0.0.0/8

TCP – Destination Port 445, 1640

Top 20 UDP destination ports (by packets) to 100.0.0.0/8

UDP – Destination Ports 10000, 161,53
100/8

- UDP port 161 – SNMP traffic – default settings in manuals
- UDP source port 10000 – 33 byte packets – micro-torrent some SNMP etc.
5/8

- Traffic spikes of up to 250Mbps
  - 5.5.5.5 – UDP – 250Byte pkts random ports/srcip
- ICMP6! 5.113.105.0/24
- Flash video – 5.45.245.0/24
105/8

TCP – Destination Port 445/8

UDP – Source Port 53, 8090

Top 20 TCP destination ports (by packets) to 105.0.0.0/8

Top 20 UDP source ports (by packets) to 105.0.0.0/8
Cumulative Distribution Function of Destination /24s in 45.0.0.0/8
Conclusions

• Pollution tends to greatly skew darknet traffic
  – Diverse darknets – diverse reasons for pollution
• General characteristics of background radiation:
  – 15-30Mbps of base traffic for /8 spikes upto 70Mbps
  – Heavily dominated by conficker for TCP traffic
  – DNS for UDP traffic from small set of servers (*)
• Sharing results with relevant RIRs so that they can determine appropriate action regarding cleanup/quarantine
Conclusions

• 100/8, 5/8, 23/8 show relatively abnormal amounts of traffic to portions of the address space
  – Special consideration for:
    • 37.61.54.0/24
    • 23.19.5/24
    • 100.100.100.0/24, 100.0.2.0/24, 100.1.1.0/24
    • 5.5.5.0/24, 5.13.105/24, 5.45.245.0/24, 5.123.252.0/24
  – 45/8, 105/8 relatively clean