



# Dark matter estimation and MPLS VPN++

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# Agenda



- Dark matter
- Who cares ?
- Estimation
- Architecture



# Dark matter

- Addresses allocated but not assigned
- Big part of the Internet is allocated but not assigned
- Coexistence with usable addresses with no discrimination
- Two types
  - (a) Unallocated subnets
  - (b) Unallocated address in subnets

# Who cares ?



- Internet scanners
- Worms
- Early signs of attacks or worm contamination

# Estimation of Dark matter



- Type a)
  - Query of the routing table and subtraction from the allocated size
- Type b)
  - Monitor the ARP table or the DHCP server of a campus network for requests

# How to deal with them ?



- Collection and if possible aggregation of the dark matter addresses
- Monitor the network traffic and then forward it to recipients
- Global estimation
- Problems
  - Explosion of the Global routing table
  - Separate treatment of network traffic
  - Sink hole in Global routing table



# MPLS VPN+

- Usage of MPLS VPN does not affect the global internet usage
- Default routing to Global routing table through a separate box running ntop or honeyD or a cleaning device.
- Policy based selection (or filter forwarding) of traffic to a VPN based on
  - Destination or Source Address
  - Destination AS (not there...)
  - Precedence



# Inter-AS

- Autonomous systems can exchange information via mBGP-vpnV4 with policies applied
- Mark more specific routes  $>/24$  with BGP-NO\_EXPORT
- Build an overlay network or a central BGP server to maintain the dark matter routes.



# MPLS VPN + +

- MPLS VPN + vpn uRPF
- can be very helpful for other tasks
  - Remote triggered filtering with source address specified
    - Announce victim address /32 with a specific community to Global routing table
    - Policy based selection addressed to victim inside the VPN
    - Announce attacker address (source\_address) inside the VPNv4 and perform remote Blackhole filtering
    - Default routing to Global routing table

# Questions



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