

BGP FlowSpec IPv6

Implementation Report

(draft-vandavelde-idr-ipv6-flowspec-imp)

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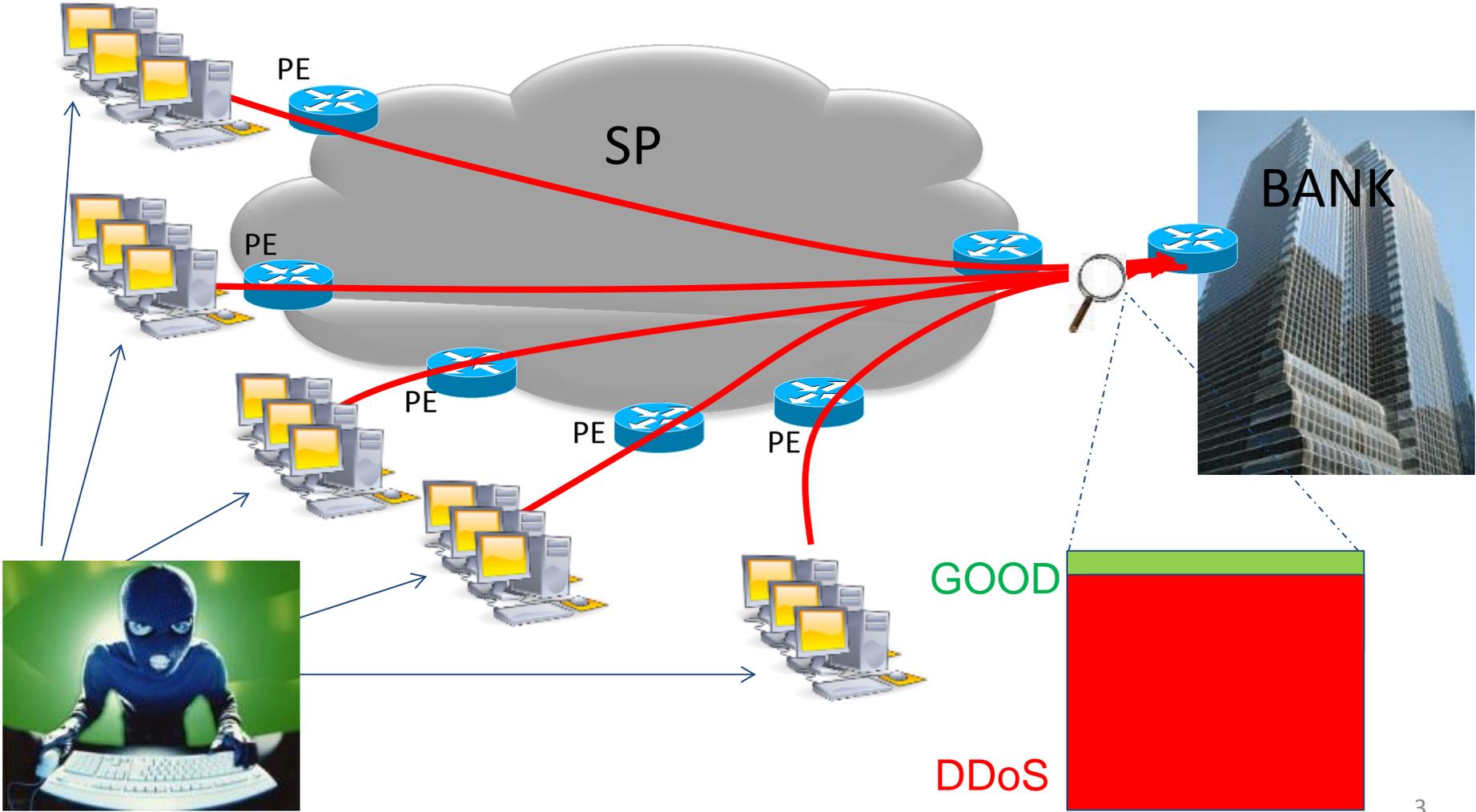
Andy Karch

Wim Henderickx

What is FlowSpec?

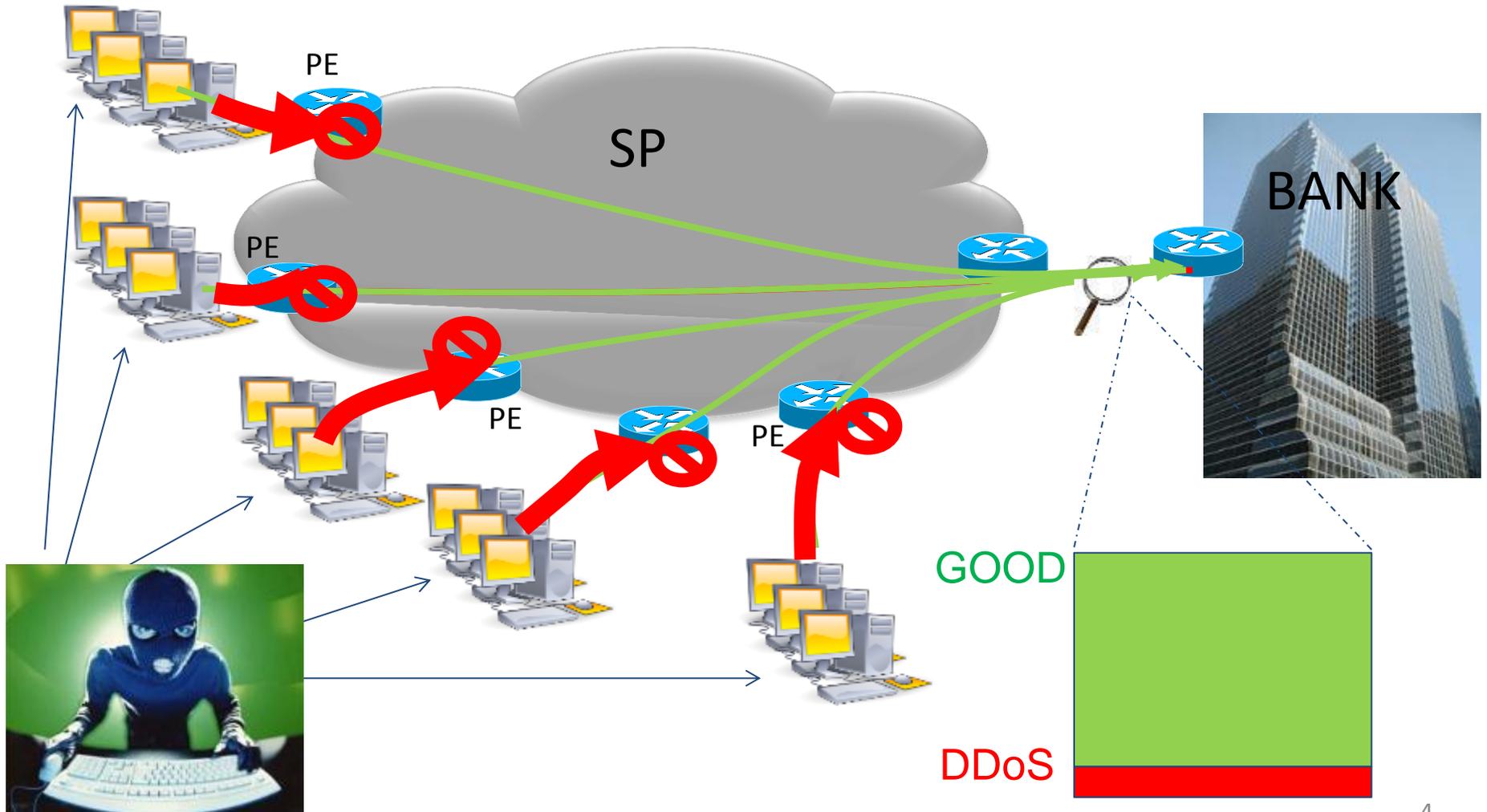
- RFC5575 - Dissemination of Flow Specification Rules
 - IPv4 Only
- draft-ietf-idr-flow-spec-v6
 - IPv6 Update
- BGP NLRI
 - IPv4 - SAFI 133
 - VPNv4 - SAFI 134
- Match and action
 - Match on all IP header fields, not just IP destination
 - Actions – rate-limit, drop, redirect, mark, sample
 - Similar to access-lists, policies, and filters
- Use-cases
 - DDoS Mitigation
 - Traffic Filtering
 - Path Selection?
 - SDN?

DDoS Impact



DDoS Mitigation

Drop at network ingress

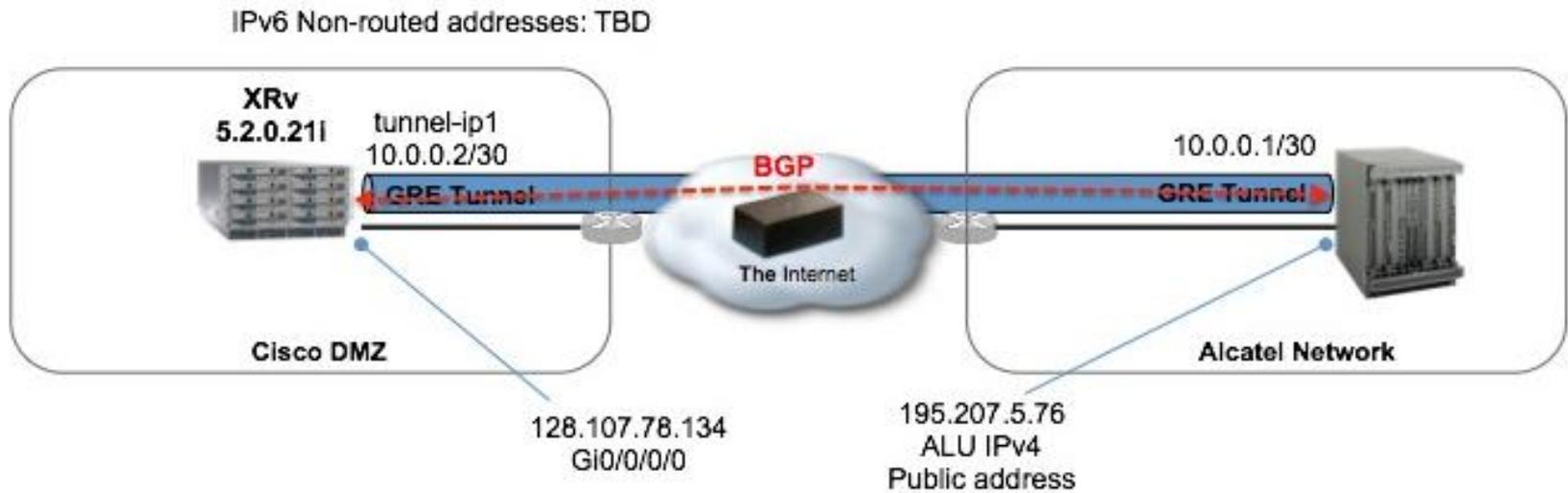


draft-ietf-idr-flow-spec-v6

Updates from -03 to -06

- Prefix Encoding
 - Clarified and example provided
- Sequential Ordering
 - Defined for IPv6 with prefix-offset
- Traffic Class
 - Changed to DSCP
- Fragmentation
 - Preserved from RFC5575
- Redirect-IPv6
 - IPv6 address specific extended community
- Flow Label
 - Size specified

Test Topology



Cisco IOS-XR	Alcatel SR-OS
Release 5.2.2	Release R.12.0.R4

Tests Results - Matches

	Cisco	Alcatel
Destination Prefix	S + R	S + R
Source Prefix	S + R	S + R
Next Header	S + R	S + R
Port	S + R	S + R
Destination Port	S + R	S + R
Source Port	S + R	S + R
ICMP Type	S + R	S + R
ICMP Code	S + R	S + R
TCP Flags	S + R	S + R
Packet Length	S + R	S + R
DSCP	S + R	S + R
Fragment	S + R	S + R
Flow Label	(untested)	(untested)

Test Results - Actions

	Cisco	Alcatel
Traffic-Rate	S + R	S + R
Traffic-Action	S + R	S + R
Redirect (ASN2)	S + R	S + R
Traffic-Marking	S + R	S + R

Issues found

- Prefix Encoding
 - Changed from (length,offset) to (offset,length) in version -03
 - An implementation already existed
 - Reverted to (length,offset) in -06

Open Issues

- Validation with prefix-offset
 - The IPv6 prefix-offset introduces an additional dimension to the original algorithm
 - The original algorithm considers more specific prefixes after the prefix length
 - In IPv6, we need to repeat the original algorithm up to the prefix-offset.

Next Steps

- draft-vandeveldede-idr-ipv6-flowspec-imp
 - Comments?
 - WG Adoption?
- draft-ietf-idr-flow-spec-v6
 - Additional comments?
 - Move towards WG last call