

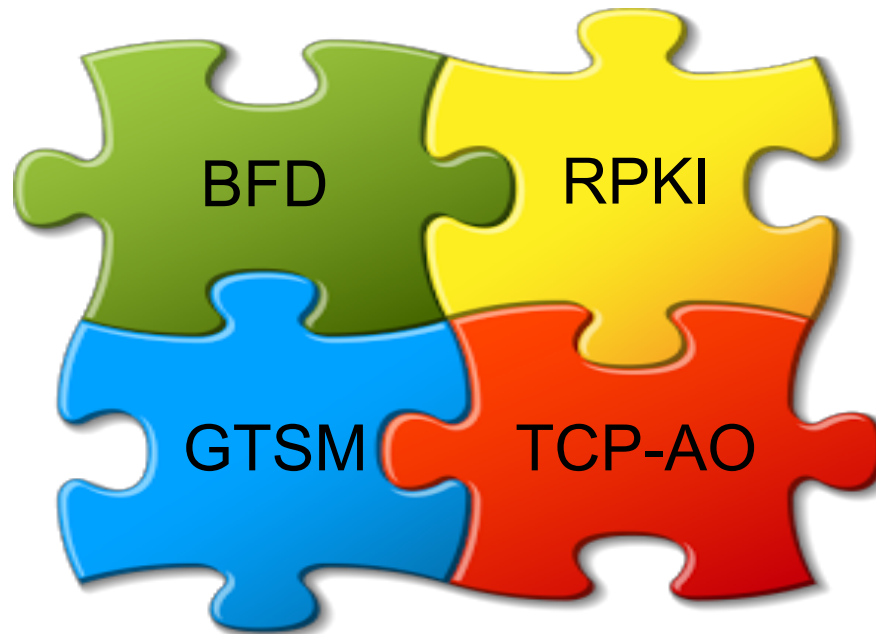


# **GTSM and BFD over IXPs**

## **... two years later**

Zbyněk Pospíchal, 9/2019

# **Important components for modern, secure and powerful BGP**



**...and BGP is the only glue keeping Internet together**

# **GTSM**

Generalized TTL Security Mechanism

RFC 5082

only packets with specified TTL accepted in a BGP session

best known protection for DDoS or RST attacks facing BGP sessions

not a direct replacement for obsolete RFC 2385 MD5, but...

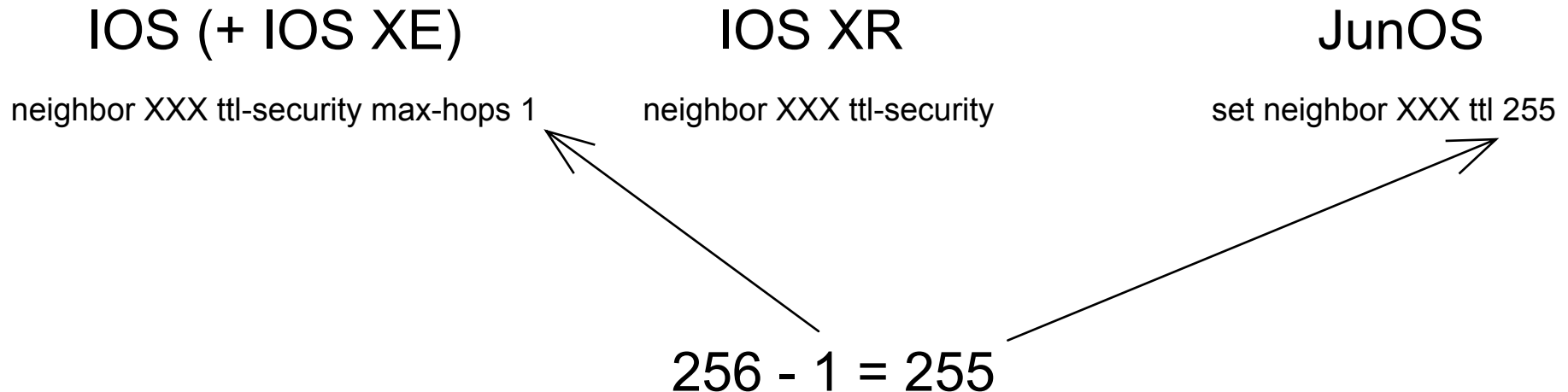
# GTSM

Generalized TTL Security Mechanism

RFC 5082

simple configuration, just one command...

... required on the both ends



# **BFD**

Bidirectional Forwarding Detection

RFC 5880 - 5884

very fast detection when any remote port or router fails

offloaded to ASICs on linecards

-> no stress for router CPUs

# BFD

## Bidirectional Forwarding Detection

RFC 5880 - 5884

relatively easy configuration

### IOS (+ IOS XE)

```
(interface)
bfd interval X multiplier Y
(router-bgp xyz)
neighbor XXX fall-over bfd (single-hop)
```

### IOS XR

```
(router bgp xyz)
bfd interval X
bfd multiplier Y
neighbor XXX bfd fast-detect
```

### JunOS

```
(edit protocols bgp group CCC)
set neighbor XXX bfd-liveness-detection
minimum-interval X
multiplier Y
```

July 2017: AS29208 enabled GTSM and BFD with first other ASN, both on IOS XR and JunOS on our side

September 2017: Public announcement, enabled to 9 ASNs in CZ/SK

September 2019: 100+ GTSM BGP & BFD sessions operational, most of them over NIX.CZ

```
RP/0/RSP0/CPU0:ASBR1-SITEL#sh bfd session | i 91.210.16
Tue Sep 19 16:01:24.481 CET
BE7.10      91.210.16.46    0s(0s*0)      5s(1s*5)      UP
BE7.10      91.210.16.59    0s(0s*0)      999ms(333ms*3) UP
BE7.10      91.210.16.85    0s(0s*0)      4500ms(900ms*5) UP
BE7.10      91.210.16.86    0s(0s*0)      10s(500ms*20)  UP
BE7.10      91.210.16.166   0s(0s*0)      1500ms(500ms*3) UP
BE7.10      91.210.16.174   0s(0s*0)      2500ms(500ms*5) UP
BE7.10      91.210.16.191   0s(0s*0)      1332ms(333ms*4) UP
BE7.10      91.210.16.45    0s(0s*0)      5s(1s*5)
BE7.10      91.210.16.60    0s(0s*0)      999ms(333ms*3)
BE7.10      91.210.16.77    0s(0s*0)      2250ms(750ms*3)
BE7.10      91.210.16.165   0s(0s*0)      1500ms(500ms*3)
```

```
zbynek@ASBR2-VEZ-re0> show bfd session | match 91.210.16
Up          ae5.10      10.000      2.000      3
Up          ae5.10      10.000      2.000      3
Up          ae5.10      0.999      0.333      3
Up          ae5.10      0.999      0.333      3
Up          ae5.10      2.250      0.750      3
Up          ae5.10      10.000      2.000      3
Up          ae5.10      40.000      2.000      3
Up          ae5.10      1.500      0.500      3
Up          ae5.10      1.500      0.500      3
Up          ae5.10      2.500      0.500      3
```

# Issues?

Some.

Crappy BFD on older Cisco IOS platforms like C7600/Cat6800

BFD between two IOS XR 4.3.x boxes didn't work -> fixed with 5.x.x

GTSM failed between IOS XR and Arista EOS 4.19.5M -> fixed with 4.20

BFD is "unsupported" on virtual interfaces (Bundle-Ether, Pw-Ether etc.)  
on IOS XR: it works, but fails in specific situations  
-> not fixed yet



# Conclusion

Problematic BFD on older equipment without hardware offloading  
... but there are many other troubles with those platforms

On modern boxes, once you see established sessions, no other  
problems follow.

**So we encourage all networks to configure  
BFD and GTSM (not only) facing us.**

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**Questions?**