



reRouter

Homemade SDN - BGP, Python,
PRTG, recipe for network admins
peaceful sleep

Dean Dubovac

Network operators group Croatia 18.9.2025.

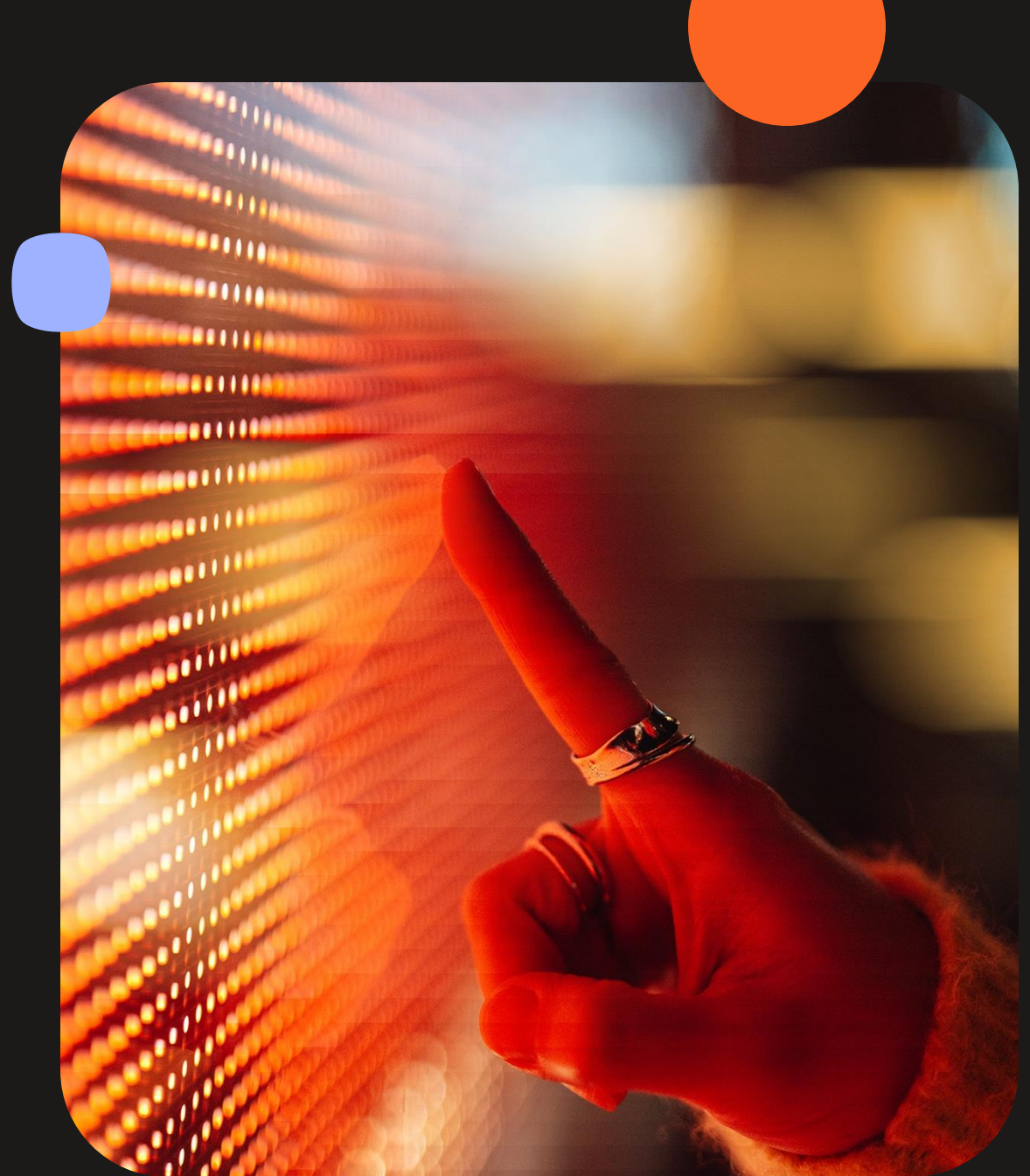


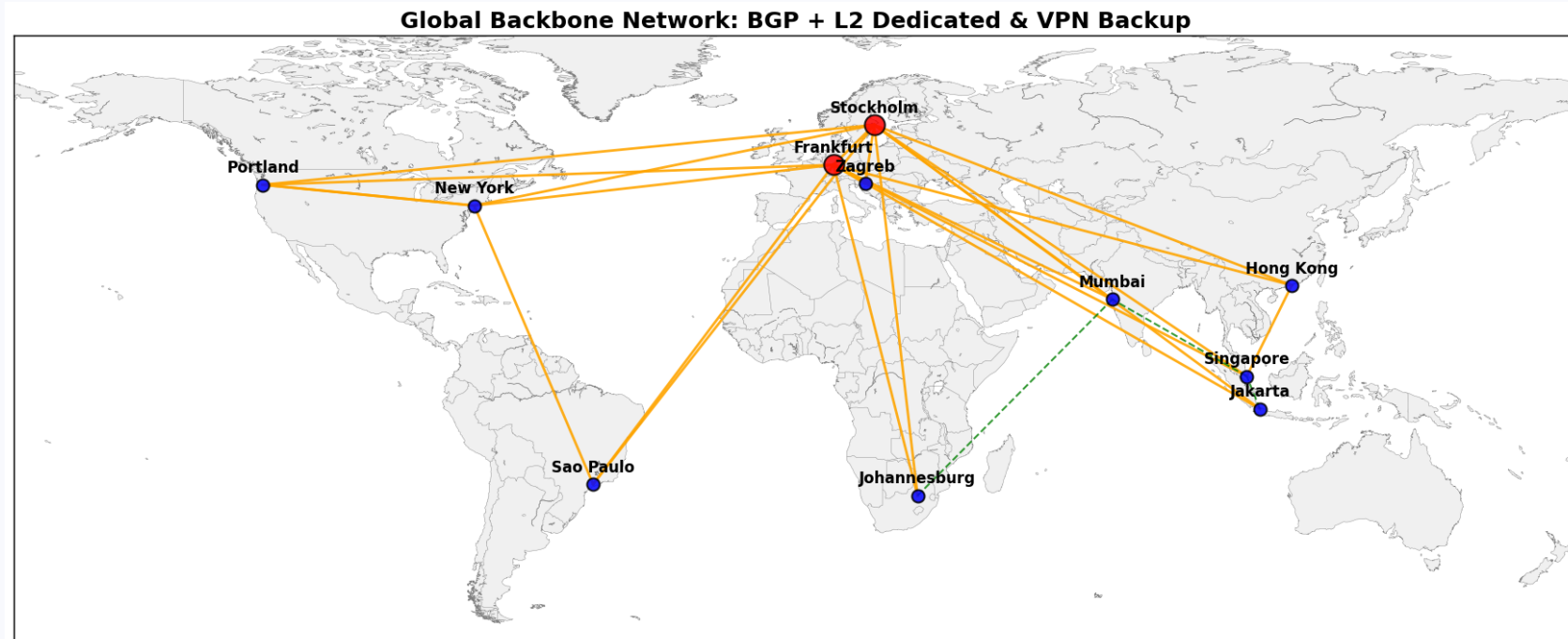
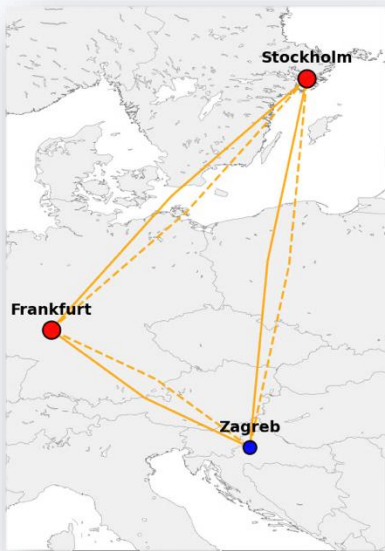


Table of contents

1. Backbone network
2. Challenge – Packet loss
3. Solution – Web tool
4. Better solution - Automation
5. How good is it?

Backbone network

- 60+ Data centers
- 390+ Devices
- 3670+ L3 interfaces
- 620+ IPSLA probes



- Dedicated L2 links
- MPLS L2 links
- IPSEC VPNs over INTERNET



Challenge – Packet loss

- „Pingalica” – in-house built probing tool
- Real time monitoring
- 840 source/destination combinations
- Grafana web UI
- Alerting
- 24/7 support team
- **0-24h Escalation to CORE NETWORK Team !!!**
 - **Reaction time from 10 to 45 minutes**



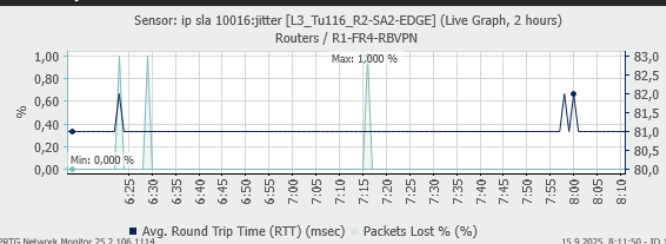
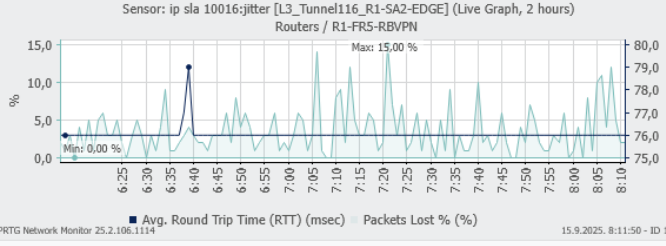
Solution – Web tool

- Needs to be simple
- Will be used by network admins
- Needs to display all relevant data
 - Available links, current packet loss, routing table, current active link, PRTG graphs
- Needs to incorporate IPSLA data from PRTG
- **Network admin need to have full control.**
 - Display all commands before sending to router

Solution – Web tool

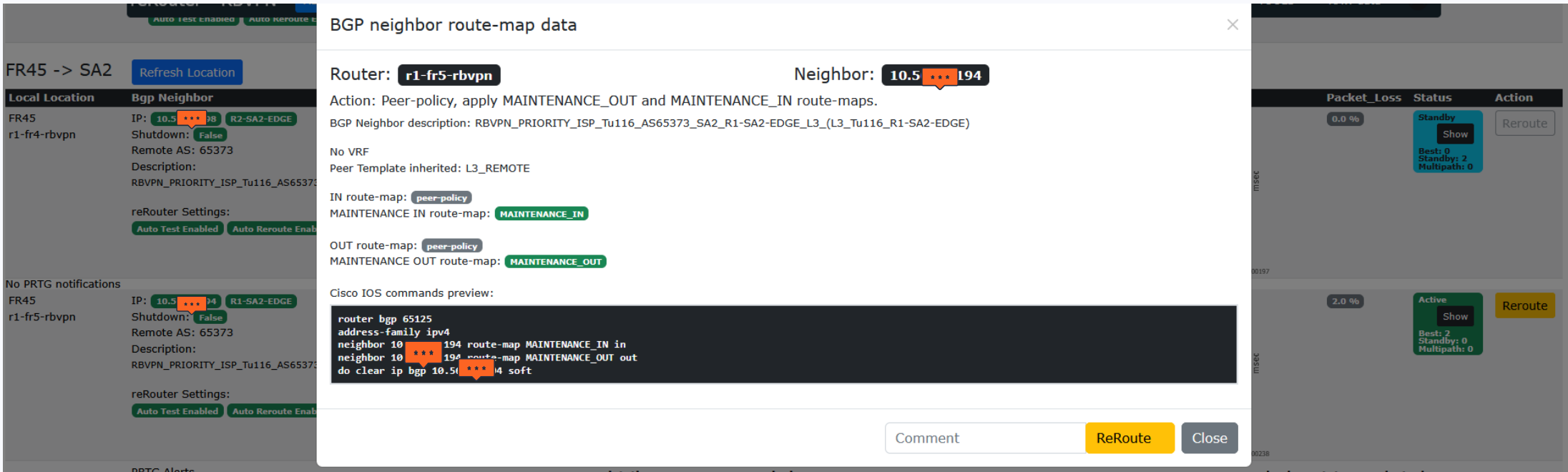
FR45 -> SA2

[Refresh Location](#)

Local Location	Bgp Neighbor	IP SLA	PRTG Graph	Packet_Loss	Status	Action
FR45 r1-fr4-rbvpn	IP: 10.56.10.198 R2-SA2-EDGE Shutdown: False Remote AS: 65373 Description: RBVPN_PRIORITY_ISP_Tu116_AS65373_SA2_R2-SA2-EDGE_L3_(L3_Tu116_R2-SA2-EDGE) reRouter Settings: Auto Test Enabled Auto Reroute Enabled	Id: 10016 Type: udp-jitter Owner: R1-FR4-RBVPN Tag: L3_Tu116_R2-SA2-EDGE	 Sensor: ip sla 10016:jitter [L3_Tu116_R2-SA2-EDGE] (Live Graph, 2 hours) Routers / R1-FR4-RBVPN PRTG Network Monitor 25.2.106.1114	0.0 %	Standby Best: 0 Standby: 2 Multipath: 0 Show	Reroute
No PRTG notifications FR45 r1-fr5-rbvpn	IP: 10.56.10.194 R1-SA2-EDGE Shutdown: False Remote AS: 65373 Description: RBVPN_PRIORITY_ISP_Tu116_AS65373_SA2_R1-SA2-EDGE_L3_(L3_Tu116_R1-SA2-EDGE) reRouter Settings: Auto Test Enabled Auto Reroute Enabled	Id: 10016 Type: udp-jitter Owner: R1-FR5-RBVPN Tag: L3_Tunnel116_R1-SA2-EDGE	 Sensor: ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE] (Live Graph, 2 hours) Routers / R1-FR5-RBVPN PRTG Network Monitor 25.2.106.1114	2.0 %	Active Best: 2 Standby: 0 Multipath: 0 Show	Reroute
PRTG Alerts						
datetime	device	sensor		check	status	lastvalue
14.9.2025. 13:41:52	R1-FR5-RBVPN	ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE]		PRTG	Warning	11 % (Packets Lost %)
14.9.2025. 10:13:52	R1-FR5-RBVPN	ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE]		PRTG	Warning	17 % (Packets Lost %)
14.9.2025. 10:02:52	R1-FR5-RBVPN	ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE]		PRTG	Warning	38 % (Packets Lost %)
11.9.2025. 11:45:52	R1-FR5-RBVPN	ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE]		PRTG	Warning	42 % (Packets Lost %)
9.9.2025. 7:39:52	R1-FR5-RBVPN	ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE]		PRTG	Warning	37 % (Packets Lost %)

Solution – Web tool

- Automated router config verification
- All command displayed before executing any action



The screenshot displays the reRouter web tool interface. On the left, a sidebar shows a list of routers under the heading "FR45 -> SA2". The main panel is titled "BGP neighbor route-map data" and shows configuration for Router: **r1-fr5-rbvpn** and Neighbor: **10.5.194**. The configuration includes:

- Action: Peer-policy, apply MAINTENANCE_OUT and MAINTENANCE_IN route-maps.
- BGP Neighbor description: RBVPN_PRIORITY_ISP_Tu116_AS65373_SA2_R1-SA2-EDGE_L3_(L3_Tu116_R1-SA2-EDGE)
- No VRF
- Peer Template inherited: L3_REMOTE
- IN route-map: **peer-policy**
- MAINTENANCE IN route-map: **MAINTENANCE_IN**
- OUT route-map: **peer-policy**
- MAINTENANCE OUT route-map: **MAINTENANCE_OUT**

Below the configuration, a "Cisco IOS commands preview" section shows the following commands:

```
router bgp 65125
address-family ipv4
neighbor 10.5.194 route-map MAINTENANCE_IN in
neighbor 10.5.194 route-map MAINTENANCE_OUT out
do clear ip bgp 10.5.194 soft
```

At the bottom of the main panel, there are buttons for "Comment", "ReRoute", and "Close". On the right side of the interface, a table displays network status information:

Packet_Loss	Status	Action
0.0 %	Standby Best: 0 Standby: 2 Multipath: 0	Show Reroute
2.0 %	Active Best: 2 Standby: 0 Multipath: 0	Show Reroute



Better solution - automation

- How to get down to 5 min packet loss fix time?
- We have IPSLA probes
- We have PRTG monitoring sending alerts when IPSLA probe detects packet loss
- We have tool which can execute commands on router
- ...

SOLUTION:

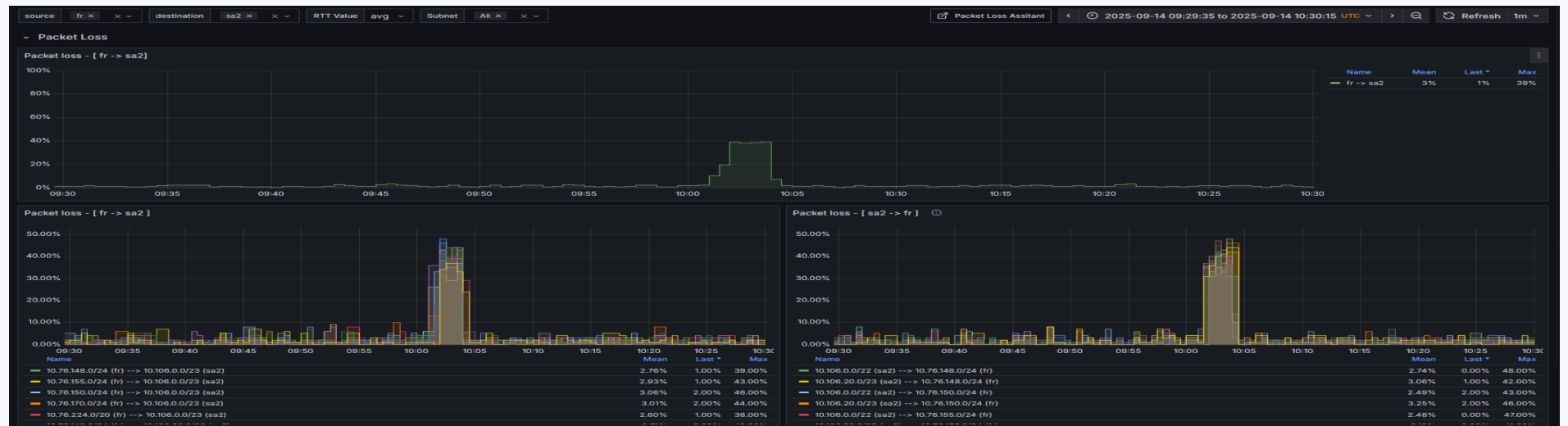
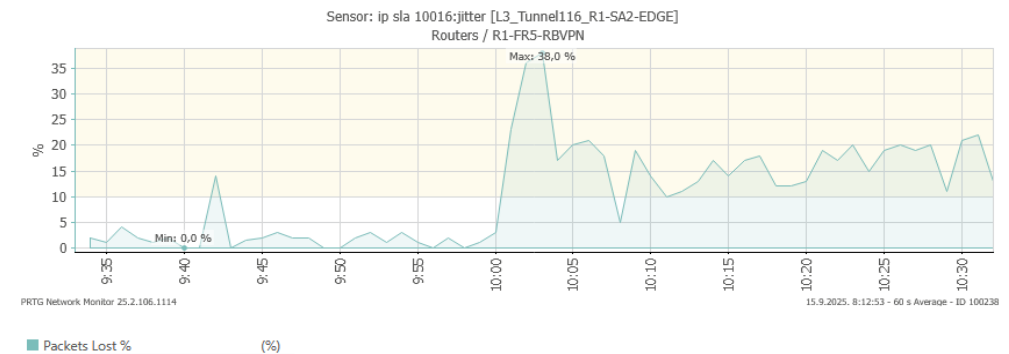
- PRTG webhook triggers reRouter API on IPSLA packet loss
- reRouter execute commands on router, and sends Slack notification to CoreNet team

How good is it ?

- 130 sucessfull reRoute actions in last 90 days
- Reaction time < 5min

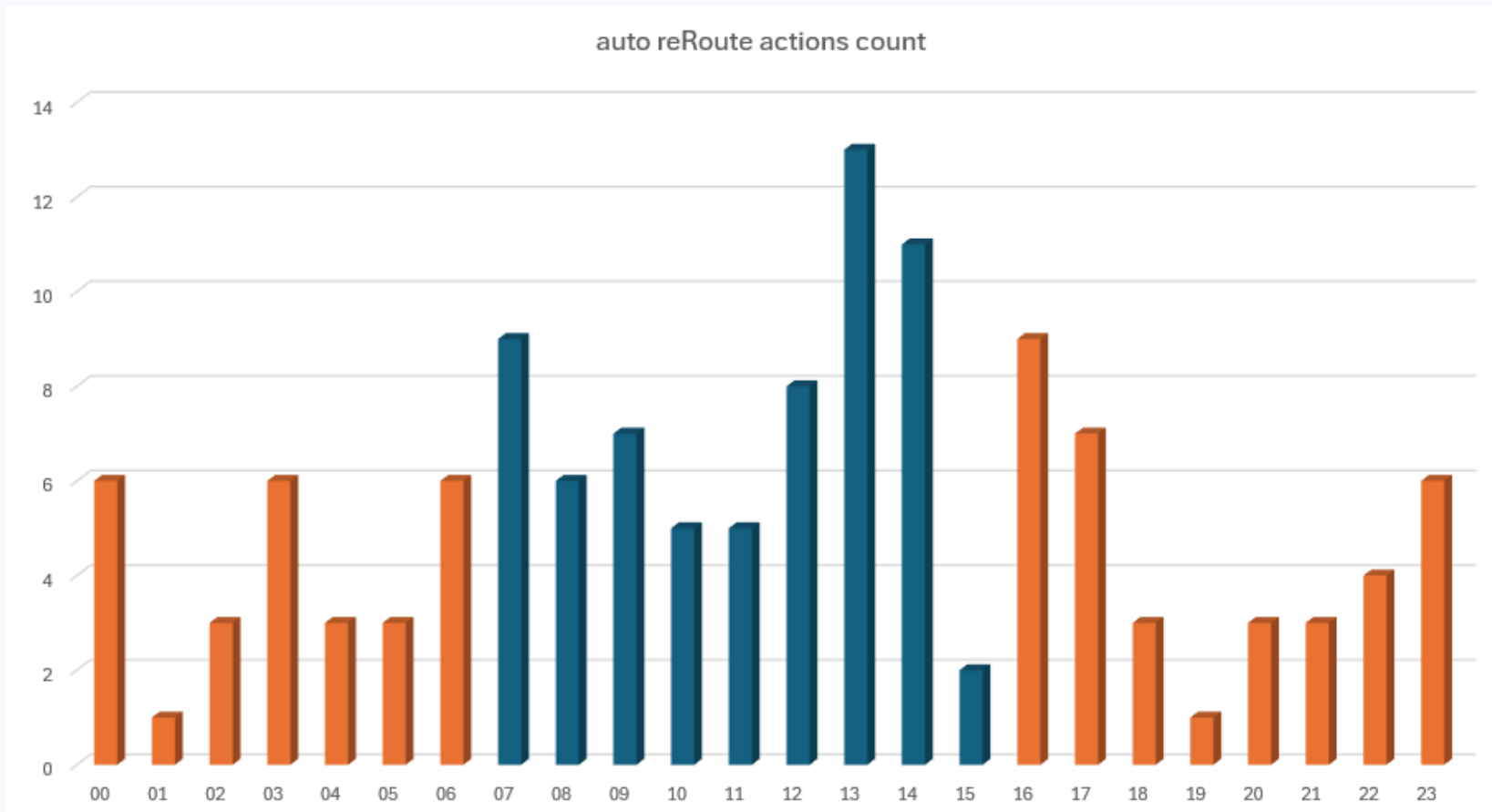
Report for ip sla 10016:jitter [L3_Tunnel116_R1-SA2-EDGE]

Report Time Span:	14.9.2025. 9:32:52 - 14.9.2025. 10:32:52
Sensor Type:	Cisco IP SLA (60 s Interval)
Probe, Group, Device:	(ANCOTEL) M3W-FR5-PRTGPC1 > Routers > R1-FR5-RBVP
Uptime Stats:	Up:
Request Stats:	Good:
Average (Packets Lost %):	10 %





Do we sleep better??



- 62 automated actions in last 3 months outside working hours



Thank you

Dean Dubovac

Senior Principal Engineer

Dean.dubovac@infobip.com

www.infobip.com

