RouterBOARD / RouterOS:

использование в важных голосовых приложениях

Александр Новаковский

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Цели проекта:

- **Отказоустойчивость**
- **Повышенная эффективность**
- **Сетевая безопасность**
- **Масштабируемость**
- **Оптимальная стоимость**

Используемые технологии:

- **Fiber Optics**
- **Ethernet, IP**
- **VLAN**
- **OSPF**
- **Wi-Fi, NV2**
- **VPLS**
- **TDMoIP**
- **FXO, FXS**
- **SIP**

Оборудование транспортной сети:

CCR1009-8G-1S

CPU 9 cores 1.2Ghz, RAM 1Gb

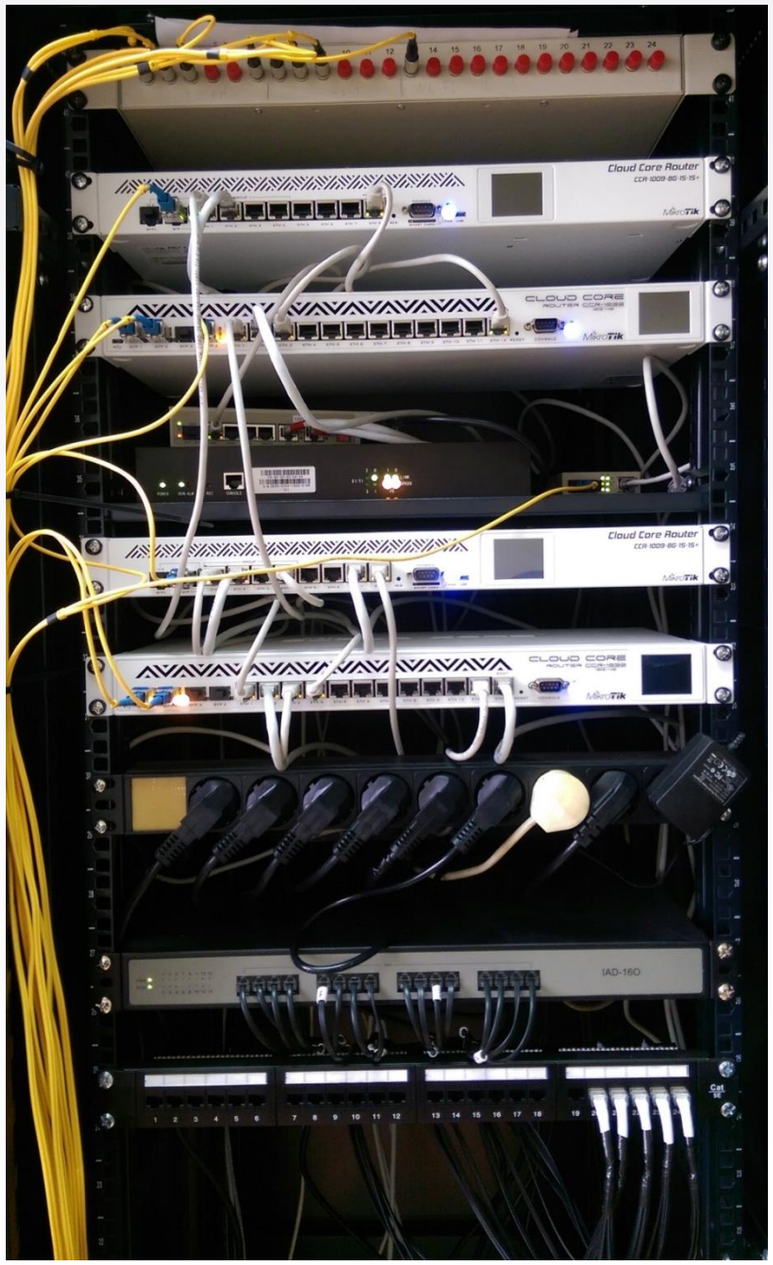
CCR1036-12G-4S

CPU 36 cores 1.2Ghz, RAM 4Gb

RB260GS

S-3553LC20D

1.25G, 1310nm/1550nm



Оборудование транспортной сети:

QRT 5 ac

Outdoor, 720 Mhz, 128Mb, 802.11ac, 24dBi

NetMetal 5

Outdoor, 720 Mhz, 128Mb, SFP, 802.11ac

ANT4958D20T-90DP

90°H/4°V, 2x20dBi

Оборудование транспортной сети:

Оборудование VoIP сети:

Dinstar MTG-600

Gaoke MG6016

Gaoke MG6008

ADNET AN-TDM-IP-2E1

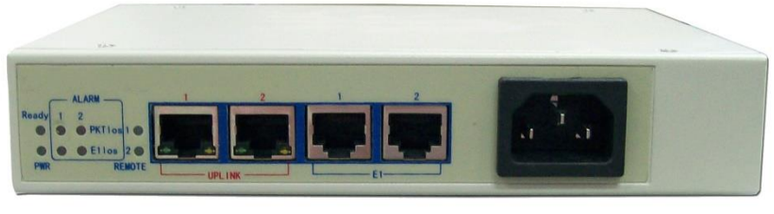
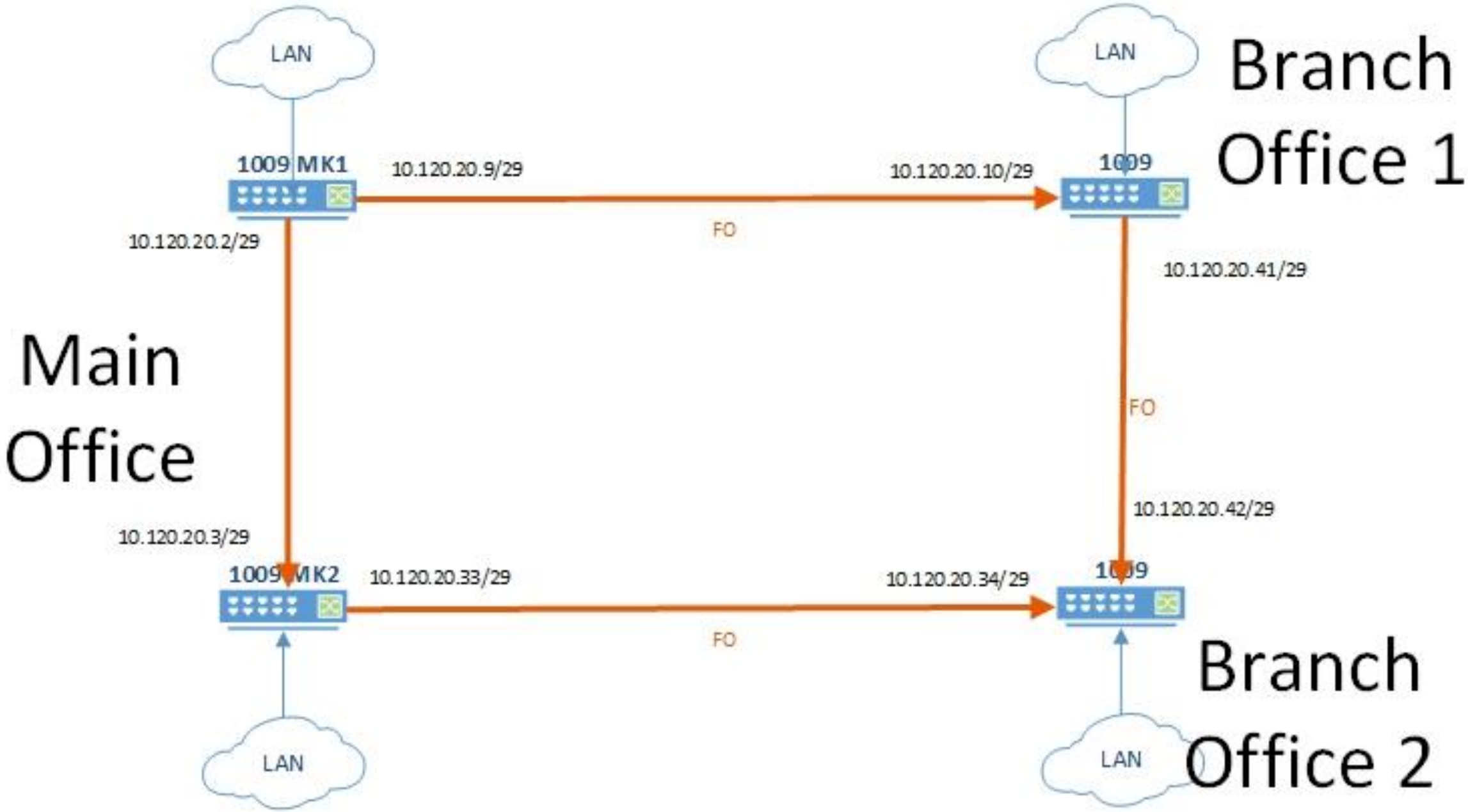


Схема транспортной сети:



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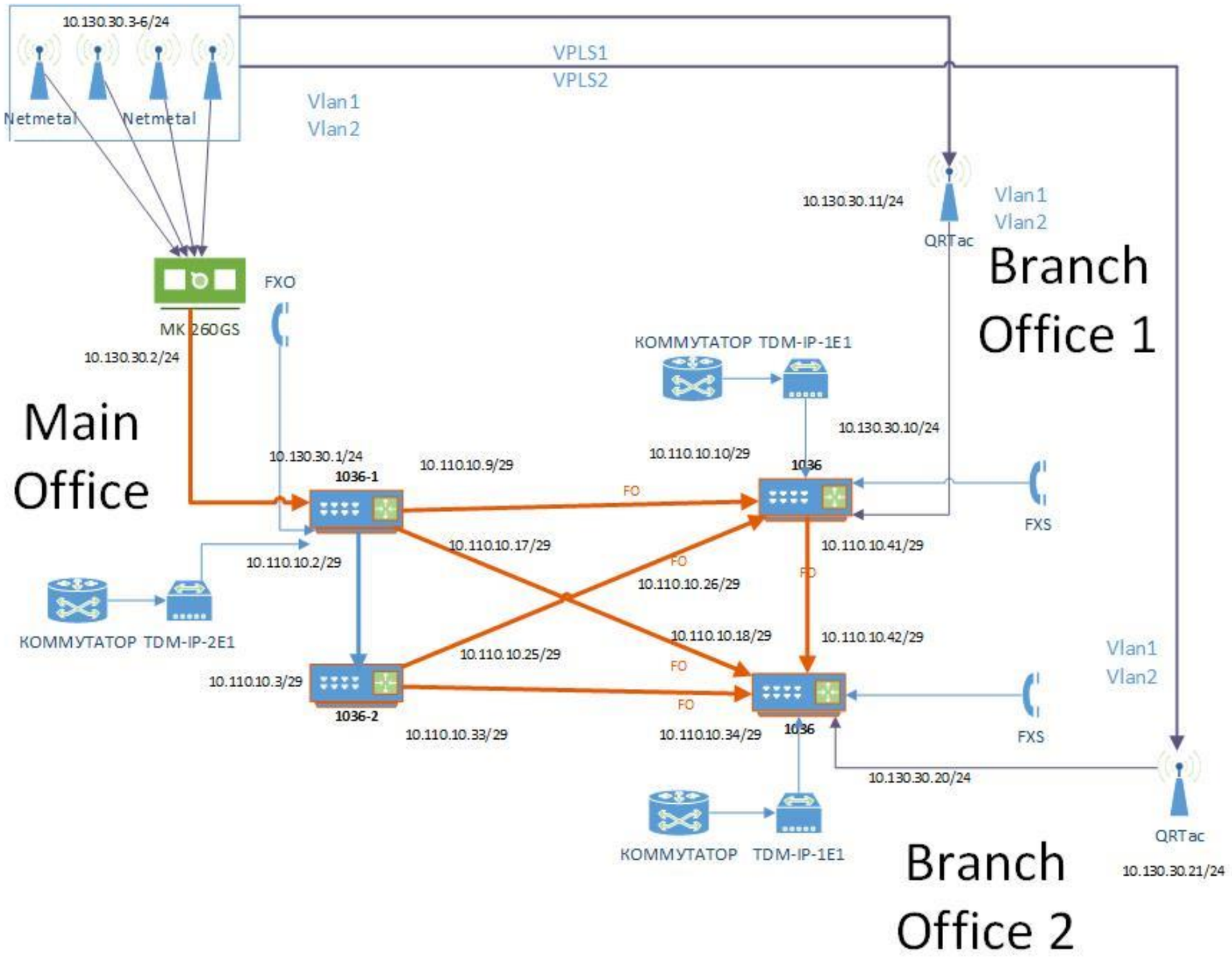
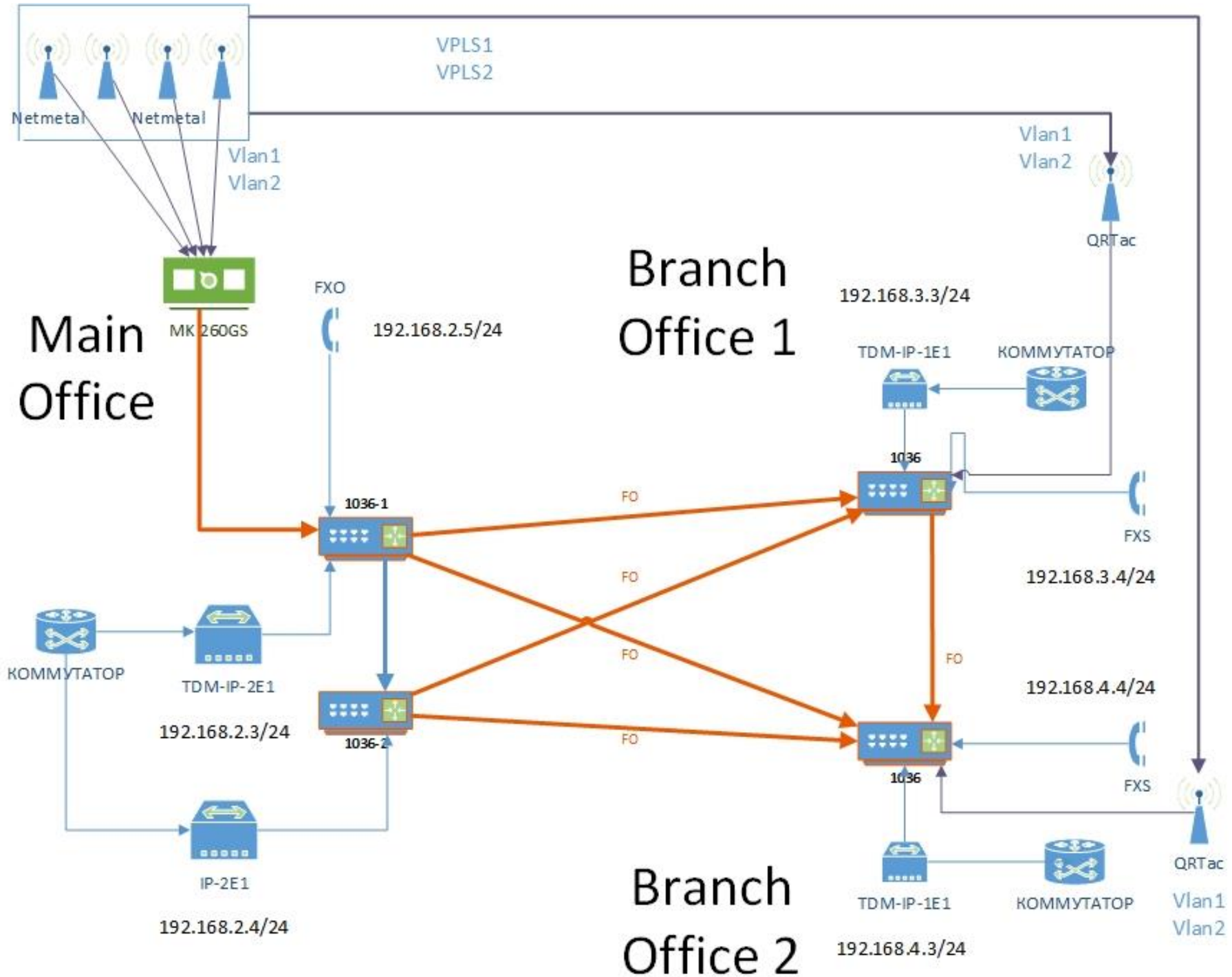


Схема VoIP сети:



Конфигурация RouterOS:

Interface List

Interface | Ethernet | EoIP Tunnel | IP Tunnel | GRE Tunnel | VLAN | VRRP | Bonding | LTE

	Name	Type	L2 MTU	Tx
;;;	WIFI			
R	sfp4	Ethernet	1580	
RS	vlan600_wifi	VLAN	1576	
R	vlan500_WIFI	VLAN	1576	16
	sfp3	Ethernet	1580	
;;;	TO_ -1036			
R	sfp2 1036	Ethernet	1580	2.5
R	vlan500-sfp2 1036	VLAN	1576	2.5
;;;	TO_ 1036			
R	sfp1 1036	Ethernet	1580	2.5
R	vlan500-sfp1 1036	VLAN	1576	2.5
RS	ether12	Ethernet	1580	9.8

Interface List

Interface | Ethernet | EoIP Tunnel | IP Tunnel | GRE Tunnel | VLAN | VRRP | Bonding | LTE

	Name	Type	MTU	L2 ...	Tx	Rx	Tx...	Rx...	VLAN ID
R	vlan500-eth1_ 1036-2	VLAN	1500	1576	76.9 kbps	7.1 kbps	10	6	500
R	vlan500-sfp1 1036	VLAN	1500	1576	2.5 Mbps	2.4 Mbps	1 ...	1 ...	500
R	vlan500-sfp2 -1036	VLAN	1500	1576	2.5 Mbps	2.4 Mbps	1 ...	1 ...	500
R	vlan500_WIFI	VLAN	1500	1576	8.0 kbps	75.9 kbps	7	12	500
S	vlan600_ _ _Mikr...	VLAN	1500	1576	0 bps	0 bps	0	0	600
RS	vlan600_wifi	VLAN	1500	1576	264 bps	1064 bps	1	3	600

OSPF

Interfaces | Instances | Networks | Areas | Area Ranges | Virtual Links | Neighbors | NBMA Neighbors

Instance	Router ID	Address	Interface	State C...
default	10.	10.	vlan500-sfp2-...	5
default	192.	10.	vlan500_WIFI	5
default	10.	10.	vlan500_WIFI	2
default	10.	10.	vlan500_WIFI	28387
default	10	10	vlan500_WIFI	287020
default	10.	10	vlan500-eth1...	5
default	10.	10.	vlan500_WIFI	12514
default	192	10	vlan500-sfp1-...	6
default	10.	10	vlan500_WIFI	2
default	10.	10.	vlan500_WIFI	2
default	10.	10.	vlan500_WIFI	7

OSPF

Interfaces | Instances | Networks | Areas | Area Ranges | Virtual Links | Neighbors | NBMA Neighbors | Sha

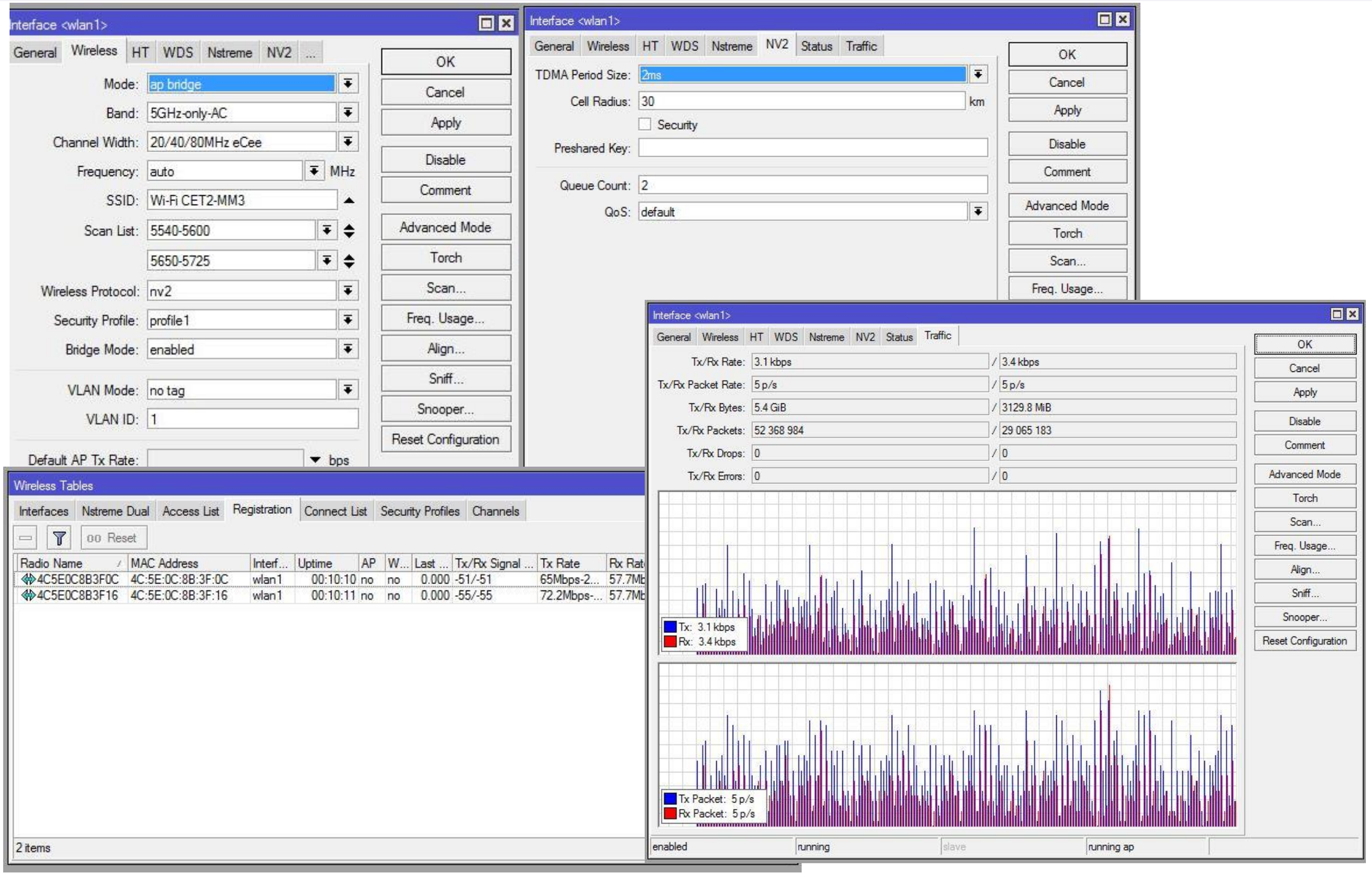
Instance	Area	Dst. Address	Gateway	Interface	Cost	State
default	backbone	192. 24	10.10.10.10	vlan500-sfp1-...	20	intra area
default	backbone	192. /24	0.0.0.0	bridge-VoIP	10	intra area
default	backbone	10. 0/29	0.0.0.0	vlan500-eth1...	10	intra area
default	backbone	10. /24	0.0.0.0	vlan500_WIFI	80	intra area
default	backbone	10. /29	0.0.0.0	vlan500-sfp1-...	10	intra area
default	backbone	10. 2/29	10.10.10.3, 1...	vlan500-eth1...	60	intra area
default	backbone	10. 3/29	0.0.0.0	vlan500-sfp2-...	10	intra area
default		0.0.0.0/0	10.10.10.3	vlan500-eth1...	11	ext 1
default	backbone	10. /29	10.10.10.10, ...	vlan500-sfp1-...	20	intra area
default	backbone	192. /24	10.10.10.18	vlan500-sfp2-...	20	intra area
default	backbone	10. /29	10.10.10.3, 1...	vlan500-eth1...	60	intra area

OSPF

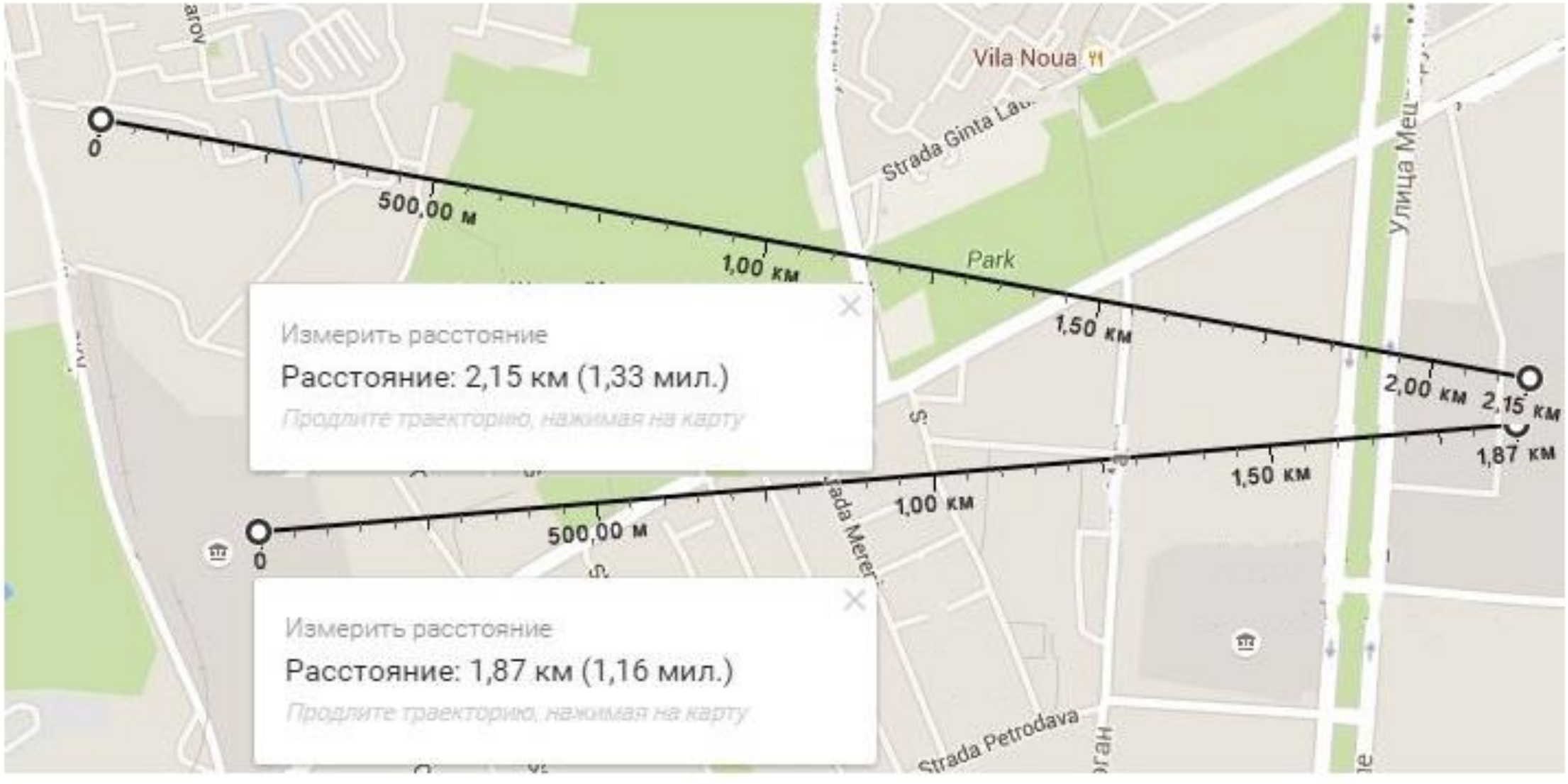
Interfaces | Instances | Networks | Areas | Area Ranges | Virtual Links | Neighbors | NBMA Neighbors | Sham Links | LSA

	Interface	Cost	P...	Aut...	Aut...	Network ...	Insta...	Area	N...	State
P	bridge-VoIP	10	1	none	*****	broadcast	default	backbone	0	passive
D	vlan500-eth1_ -1036-2	10	1	none	*****	broadcast	default	backbone	1	designated router
D	vlan500-sfp1 -1036	10	1	none	*****	broadcast	default	backbone	1	backup
D	vlan500-sfp2 -1036	10	1	none	*****	broadcast	default	backbone	1	backup
	vlan500_WIFI	80	1	none	*****	broadcast	default	backbone	8	dr other

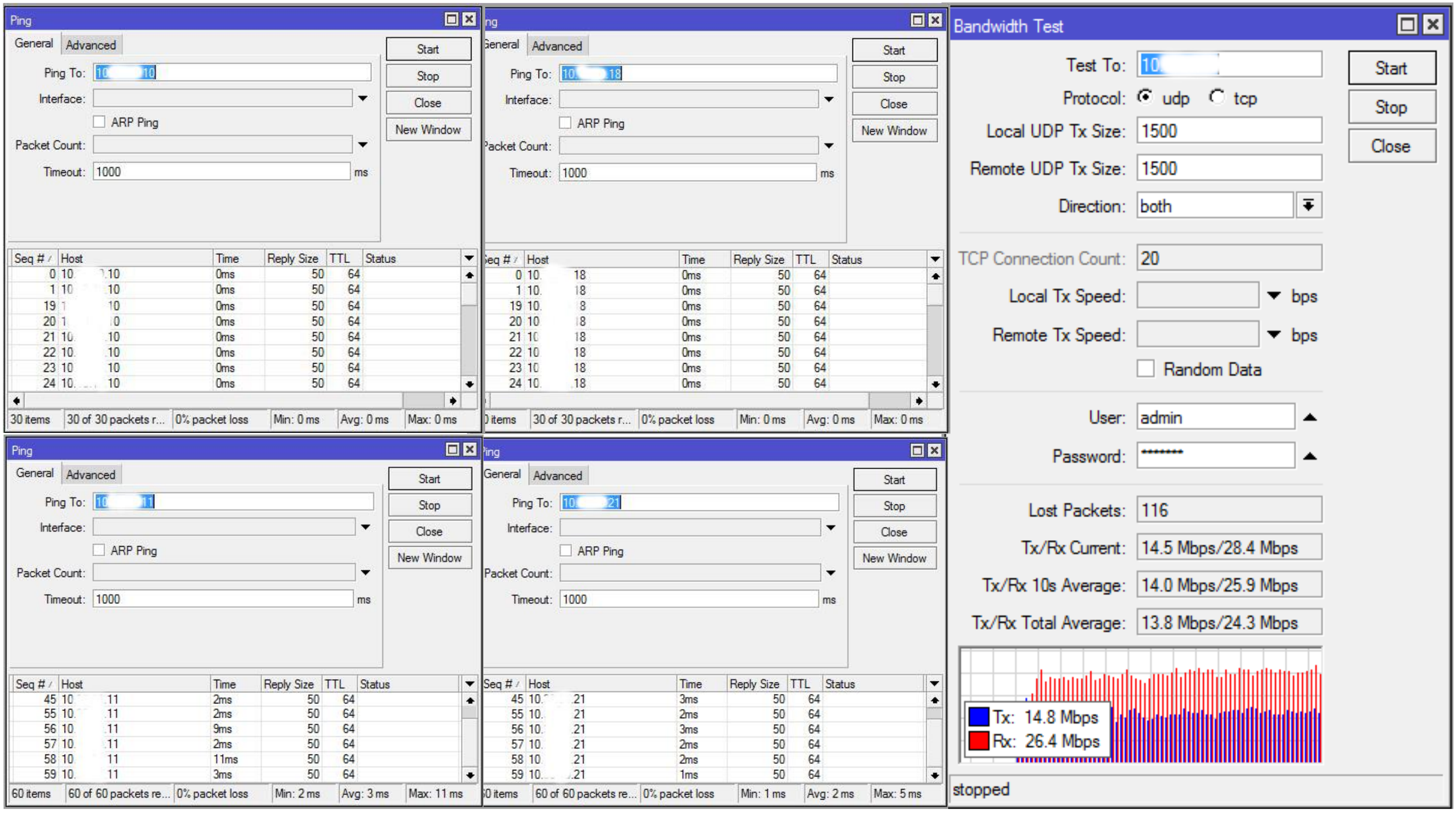
Конфигурация RouterOS:



Тесты:


Vila Noua
Park
Strada Petrodava
0
500,00 м
1,00 км
1,50 км
2,00 км
2,15 км
1,87 км
Измерить расстояние
Расстояние: 2,15 км (1,33 мил.)
Продлите траекторию, нажимая на карту
Измерить расстояние
Расстояние: 1,87 км (1,16 мил.)
Продлите траекторию, нажимая на карту

Тесты:


Ping
General
Advanced
Start
Stop
Close
New Window
Ping To:
Interface:
ARP Ping
Packet Count:
Timeout:
1000
ms
Seq #
Host
Time
Reply Size
TTL
Status
30 items
30 of 30 packets r...
0% packet loss
Min: 0 ms
Avg: 0 ms
Max: 0 ms
60 items
60 of 60 packets re...
Min: 2 ms
Avg: 3 ms
Max: 11 ms
Min: 1 ms
Avg: 2 ms
Max: 5 ms
Bandwidth Test
Test To:
Protocol:
udp
tcp
Local UDP Tx Size:
1500
Remote UDP Tx Size:
Direction:
both
TCP Connection Count:
20
Local Tx Speed:
Remote Tx Speed:
bps
Random Data
User:
admin
Password:
Lost Packets:
116
Tx/Rx Current:
14.5 Mbps/28.4 Mbps
Tx/Rx 10s Average:
14.0 Mbps/25.9 Mbps
Tx/Rx Total Average:
13.8 Mbps/24.3 Mbps
Tx: 14.8 Mbps
Rx: 26.4 Mbps
stopped

Тесты:

E1 Management --> E1 Port (PW Configuration)

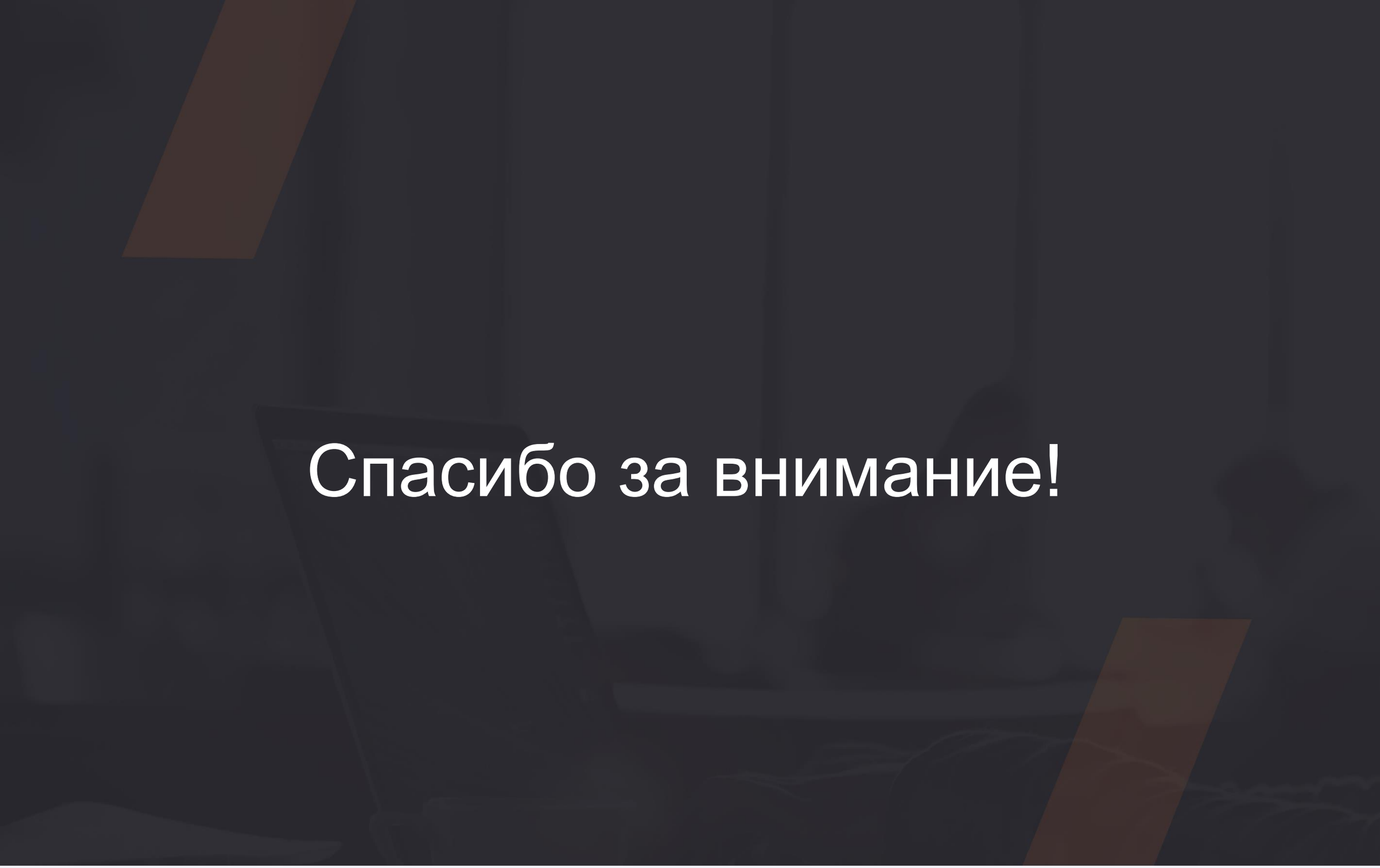
Port	Service Name	Enable	Timing Mode	Jitter Buffer	Destination IP	UDP Port	
						Source	Destination
1		☑	Adaptive ▼	10 ms		2142	2142

Submit Reset

E1 Management --> E1 Port (PW Configuration)

Port	Service Name	Enable	Timing Mode	Jitter Buffer	Destination IP	UDP Port	
						Source	Destination
1		☑	Adaptive ▼	30 ms		2142	2142

Submit Reset



Спасибо за внимание!

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