



**TEMA: Si kemi ndertuar nje Internet Service Provider vetem
me Mikrotik**

How to build an ISP business with Mikrotik Only

STARNET SH.P.K

Permbajtja:

- ▶ Kush eshte StarNet shpk?
- ▶ Profil I themeluesit, Dritan Vreshta.
- ▶ StarNet, si filloi gjithcka?
- ▶ Si u njohem me teknologjine MikroTik
- ▶ Rrjeti Aktual dhe Struktura
 - ▶ CPE
 - ▶ Paisjet ne kulla
 - ▶ Backbone dhe Core
- ▶ Konfigurime te per gjithshme te ISP
- ▶ Projekte te tjera bazuar mbi Mikrotik
- ▶ Trajnimet



Kush eshte StarNet shpk?

- ▶ Themeluar: Janar 2014
- ▶ 17 Vjet ne fushen e Telekomunikacionit
- ▶ 7 Vjet ne sherbime Wireless
- ▶ AS Number: 60304
- ▶ 20 Punonjes ne 5 Qytete
 - ▶ Tirane dhe rrethinat
 - ▶ Durres
 - ▶ Korce & Pogradec & Devoll
- ▶ Bashkepuntore:



SP LYNX

HS
NETWORK
MANAGER

OPEN SKY™
INTERNET VIA SATELLITE



Profil I themeluesit :

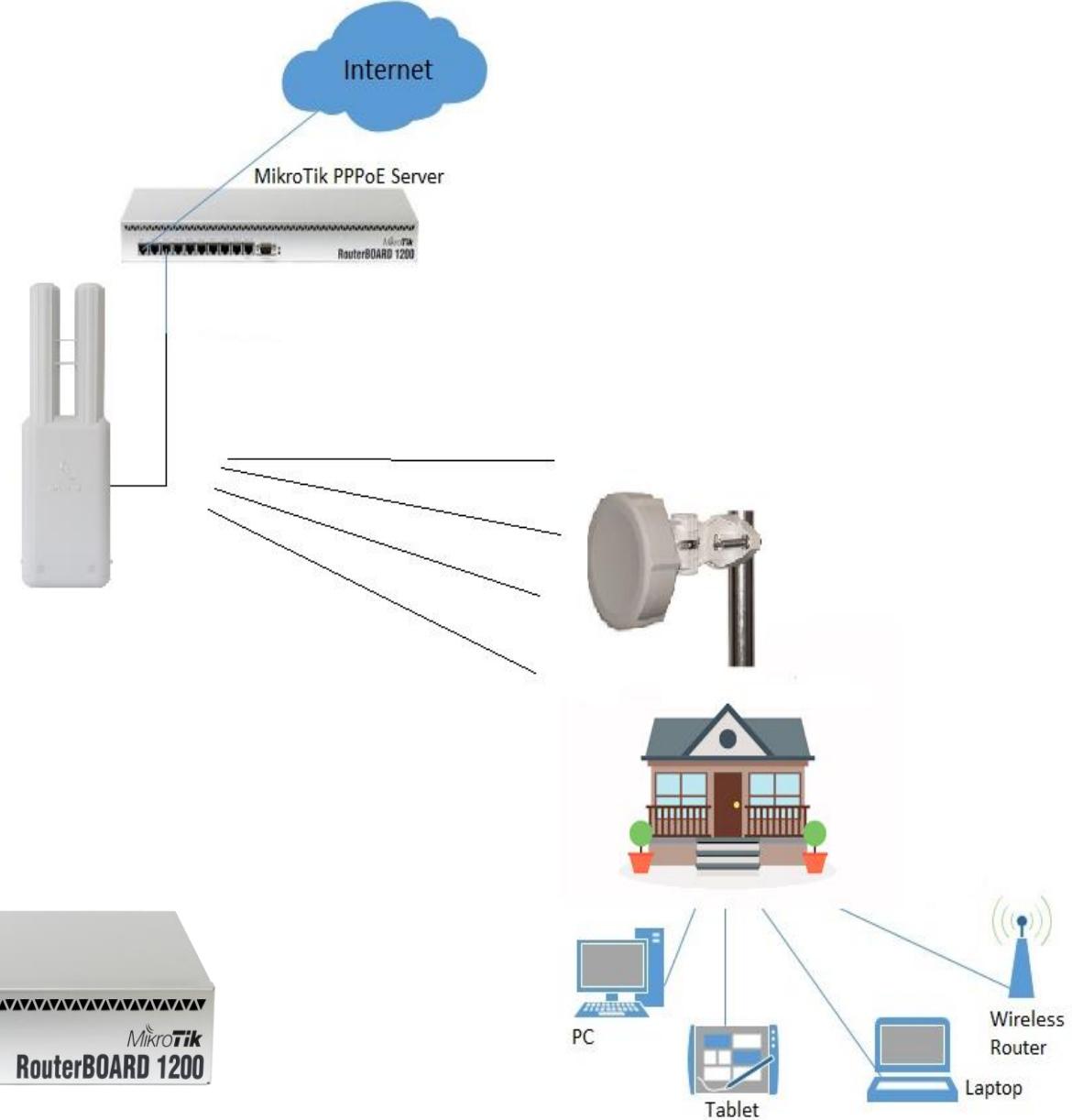


- ▶ Kam studiuar Fakulteti I Shkencave te Natyres
- ▶ Aktiv ne fushen e telekomunikacionit qe prej vitit 2000
- ▶ Themelues:
 - ▶ Starsat-International
 - ▶ Starnet ne 2014
- ▶ MikroTik Certified
 - ▶ MTCNA
 - ▶ MTCRE
 - ▶ MTCINE

STARNET! Si filloj gjithcka?

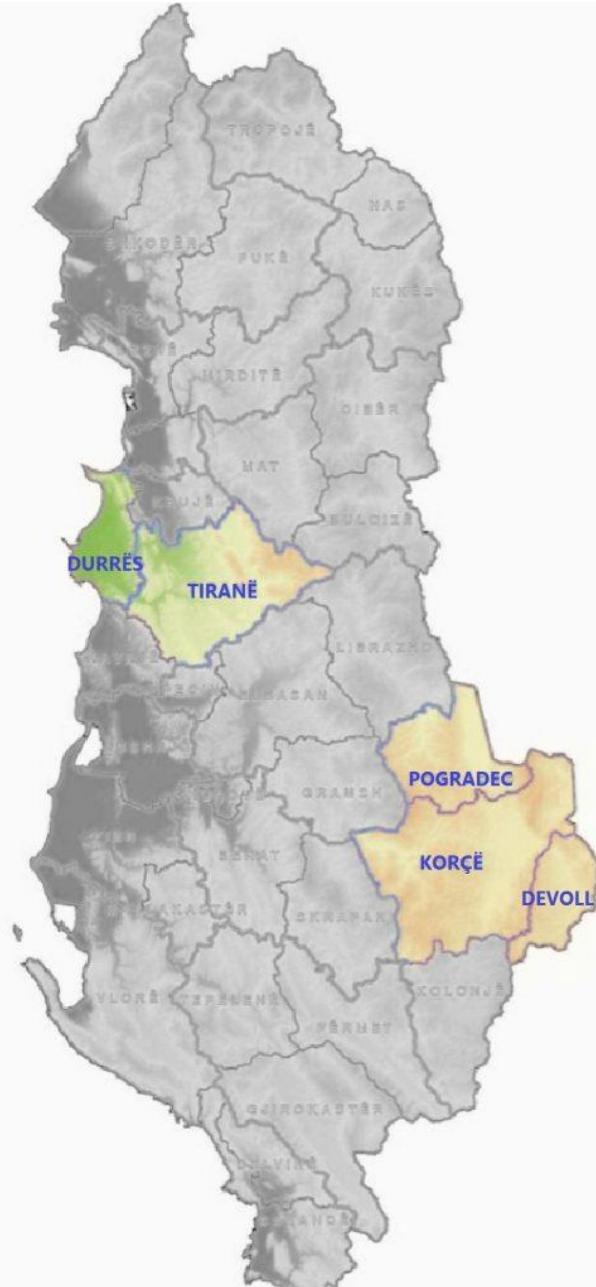
- ▶ Analiza e situates ne vitin 2011
- ▶ Pse zgjodhem te punojme me Mikrotik?
- ▶ European MUM - Varshave 2012
- ▶ Fillimi me dy Routera RB 1200

(te cilet jane akoma edhe sot funksionale dhe ne pune)



Disa elemente te rendesishem:

- ▶ Idete e medha rrallehere mbeshteten finaciarisht.
- ▶ Filluam nga nje pike e dobet e situates aktuale (2011)
- ▶ Ne nje moment te caktuar duhet te fitonim dicka
- ▶ Te kemi nje TARGET preciz
- ▶ “Keep it simple” dhe optimizoni cdo gje



WIRELESS COVERAGE

- Tetor 2018

- ▶ 100% e rrjetit eshte bazuar mbi paisjet Mikrotik dhe ne total jane 4000-5000 paisje mikrotik ne rrjet
- ▶ 3000 paisje te konfiguruara si CPE (nga ana e klientit pa numeruar rruterat e brendshem)
- ▶ 1000 paisje ne Kulla

CPE

- ▶ Tipet e ndryshme qe perdorim dhe arsyet per cdo perdorim



- ▶ Konfigurimi baze
- ▶ Sygjerime dhe praktikat me te mira
- ▶ Monitorimi dhe scriptet

Konfigurace

AP Client <D4:CA:6D:AC:61:5B>

General	802.1x	Signal	Nstreme	NV2
Last Activity:	0.000 s			
Tx/Rx Signal Strength:	-66/-62 dBm			
Tx/Rx Signal Strength Ch0:	-72/-68 dBm			
Tx/Rx Signal Strength Ch1:	-67/-63 dBm			
Tx/Rx Signal Strength Ch2:				
Signal To Noise:	50 dB			
Tx/Rx CCQ:	51/82 %			
P Throughput:				
- Signal Strengths -				
Rate	Strength	Last Me		
HT20-7	-66	00:0		
48Mbps	-65	00:0		
54Mbps	-65	00:0		
24Mbps	-64	05:5		
HT20-6	-64	00:0		
9Mbps	-63	10:3		
18Mbps	-63	09:0		
36Mbps	-63	00:0		
HT20-0	-63	10:4		
HT20-1	-63	10:3		
HT20-2	-63	04:5		
HT20-3	-63	00:0		
HT20-4	-63	00:0		
6Mbps	-62	0		
12Mbps	-62	09:0		
HT20-5	-62	0		

Interface <wlan1>

General	Wireless	Data Rates	Advanced	HT	HT MCS	WDS	...
Mode:	station						
Band:	5GHz-A/N						
Channel Width:	20MHz						
Frequency:	5120						
SSID:	starwifi_preze 2						
Radio Name:	Roland Vulka						
Scan List:	default						
	5100-5900						
Wireless Protocol:	any						
Security Profile:	default						
Frequency Mode:	superchannel						
Country:	no_country_set						
Antenna Gain:	0						
WMM Support:	disabled						
Station Roaming:	enabled						
	<input checked="" type="checkbox"/> Default Authenti						
Multicast Helper:	default						
	<input checked="" type="checkbox"/> Multicast Bufferin						
	<input checked="" type="checkbox"/> Keepalive Frame						

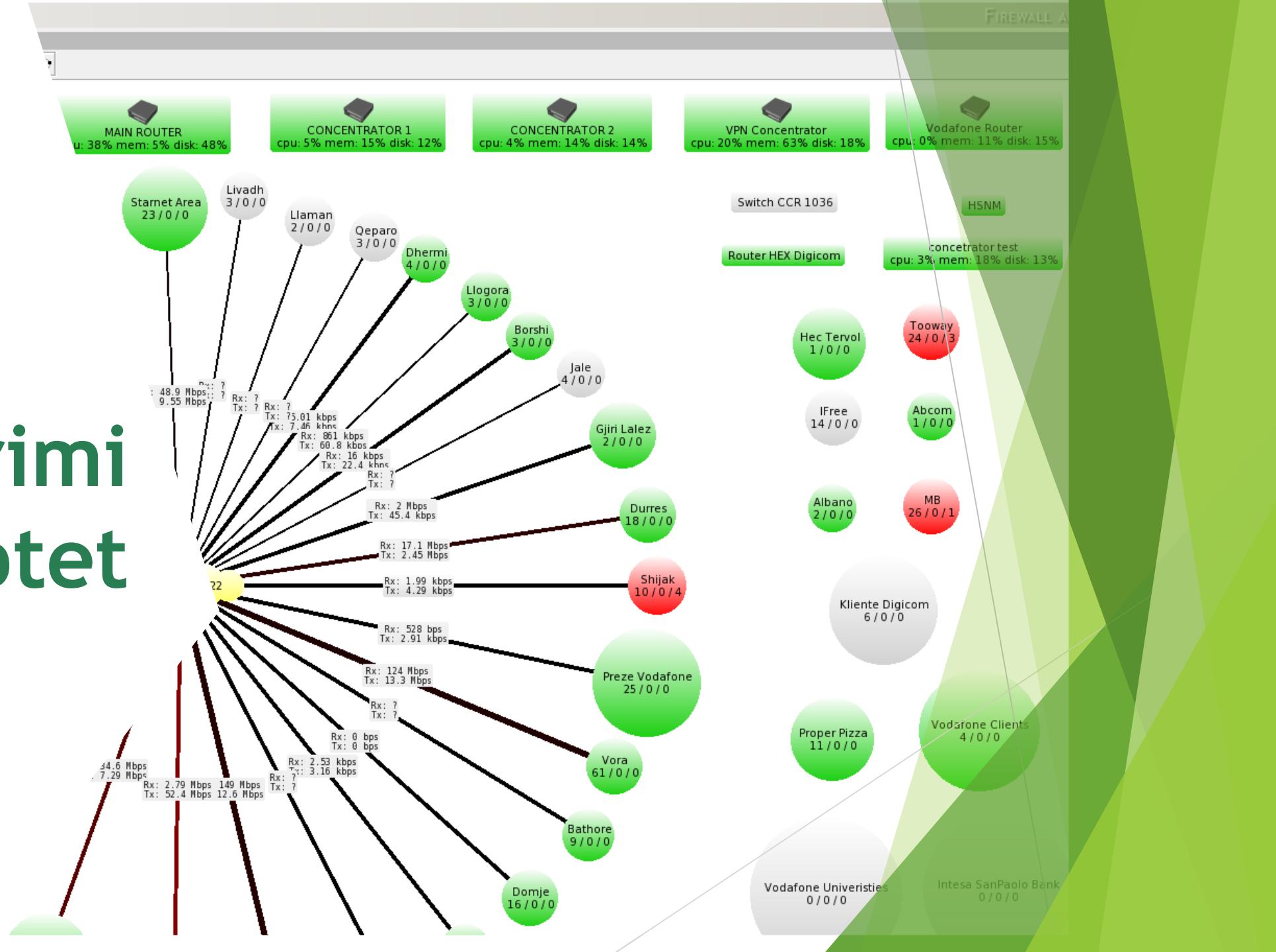
Interface <wlan1>

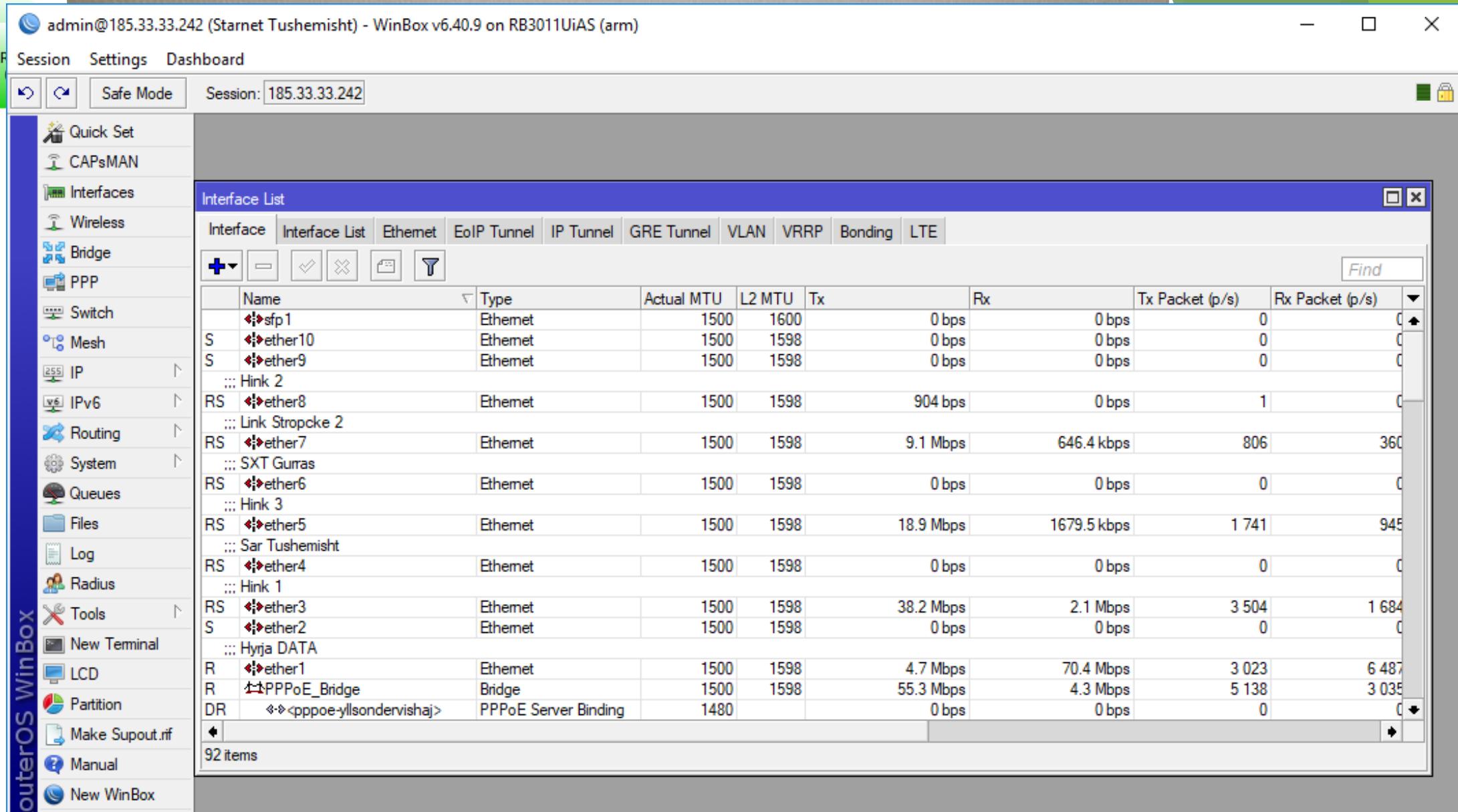
Nstreme	NV2	Tx Power	Current Tx Power	Advanced Status	...
<input checked="" type="checkbox"/> Security					
Preshared Key: st@rvo					
<input type="button" value="OK"/>					
<input type="button" value="Cancel"/>					
<input type="button" value="Apply"/>					

Interface <pppoe-out1>

General	Dial Out	Status	Traffic
Service: <input type="text"/>			
AC Name: <input type="text"/>			
User: rolandvulka			
Password: rolandvulka			
Profile: default			
Keepalive Timeout: 10			
<input type="checkbox"/> Dial On Demand			
<input checked="" type="checkbox"/> Use Peer DNS			
<input checked="" type="checkbox"/> Add Default Route			
Default Route Distance: 0			
Allow: <input checked="" type="checkbox"/> mschap2 <input checked="" type="checkbox"/> mschap1			
<input checked="" type="checkbox"/> chap <input checked="" type="checkbox"/> pap			
enabled running slave Status: connected			

Monitorimi dhe scriptet





Paisjet ne kulla

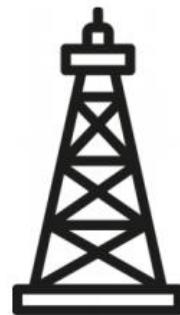
- ▶ Qendrueshmeria e paisjeve ne kulla
- ▶ Ruterat qe perdonim dhe eksperianca me e mire
- ▶ AP, konfigurimet dhe praktikat me te mira
- ▶ Menaxhimi i frekuencave dhe conformiteti i paisjeve mikrotik
- ▶ Shembull te rezultateve



INFRASTRUKTURA e RRJETIT



Routerboard Hex lite
or similar 1xCPU



Routerboard Hex/RB3011

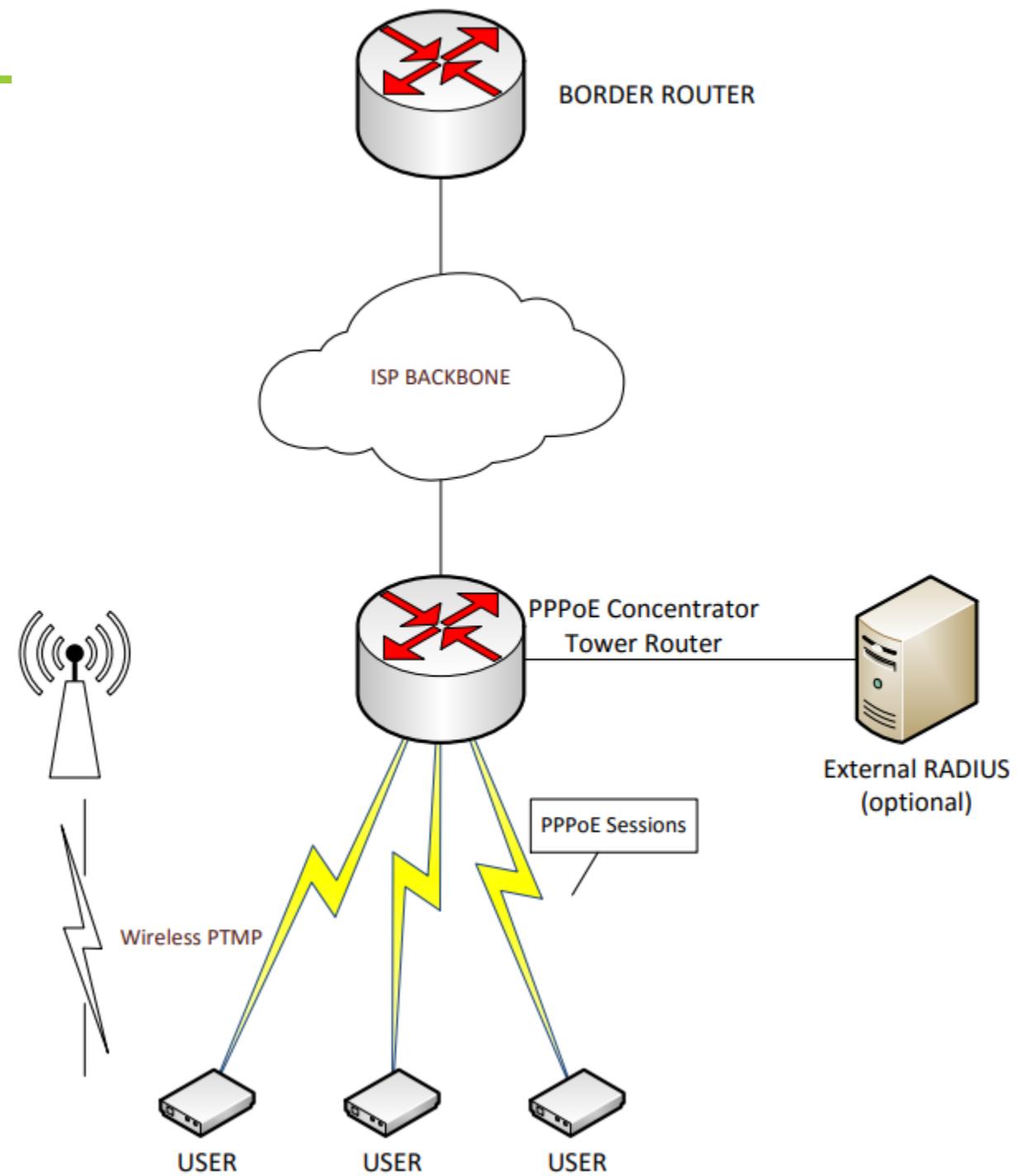


RB1100AHx2; CCR1009

Kulle e vogel
~40 klientë

Kulle e mesme
~100 klientë

Kulle e madhe
>100 klientë



Backbone dhe Core

- ▶ SFP Mikrotik dhe rezultatet e deri tanishme
- ▶ Shembulj te nderfaqesimit ne situtat te ndryshme me operatoret te ndryshem dhe teknologji te ndryshme
- ▶ Rutimet e avancuara BGP (*aktualisht me 3 operatore dhe 1 exchange*)
- ▶ Shembuj te performances se Ruterave BGP
- ▶ Shembuj te performances se Switch Mikrotik

Interface List										
	Interface	Interface List	Ethernet	EoIP Tunnel	IP Tunnel	GRE Tunnel	VLAN	VRRP	Bonding	LTE
R	LoopBack	Bridge			0 bps	0 bps	0	0	0 bps	0 bps
R	ether1 -	Ethernet			0 bps	0 bps	0	0	0 bps	0 bps
R	sfp1 - MTX 1	Ethernet			53.6 Mbps	197.7 Mbps	20 172	23 363	53.6 Mbps	197.7 Mbps
R	sfp2 - MTX 2	Ethernet			0 bps	16.3 Mbps	0	2 519	0 bps	16.3 Mbps
R	sfp3 - GGC ABCOM 1	Ethernet			21.5 Mbps	596.0 Mbps	21 011	53 537	21.5 Mbps	596.0 Mbps
R	sfp4 - CONC 2	Ethernet			314.1 Mbps	24.6 Mbps	30 315	14 978	314.1 Mbps	24.6 Mbps
R	sfp5 - AT	Ethernet			2.9 Mbps	26.4 Mbps	1 241	2 766	2.9 Mbps	26.4 Mbps
R	vlan235_Menaxhim_AT_PROJECT	VLAN			4.1 kbps	4.1 kbps	1	1	0 bps	4.1 kbps
R	vlan236-AT_Project	VLAN			0 bps	0 bps	0	0	0 bps	0 bps
R	vlan_ALBIX	VLAN			2.6 Mbps	5.9 Mbps	953	572	0 bps	5.9 Mbps
R	vlan_AT_INTERNET	VLAN			231.6 kbps	20.4 Mbps	287	2 195	0 bps	20.4 Mbps
R	sfp6 - MAIN ROUTER	Ethernet			245.3 Mbps	27.6 Mbps	25 522	14 532	245.3 Mbps	27.6 Mbps
R	sfp7 - CONC 1	Ethernet			280.2 Mbps	25.3 Mbps	29 450	16 076	280.2 Mbps	25.3 Mbps
R	sfp8-SwitchOS	Ethernet			1276.0 kbps	5.2 Mbps	1 509	1 497	1276.0 kbps	5.2 Mbps
X	vlan_CONC 1	VLAN			0 bps	0 bps	0	0	0 bps	0 bps
X	vlan_CONC 2	VLAN			0 bps	0 bps	0	0	0 bps	0 bps
X	vlan_Servers	VLAN			0 bps	0 bps	0	0	0 bps	0 bps

Session Settings Dashboard

Safe Mode Session: [REDACTED]

Quick Set

Interfaces

Bridge

Mesh

IP

Routing

System

Queues

Files

Log

Radius

Tools

New Terminal

LCD

Partition

Make Supout.rf

Manual

New WinBox

Exit

RouterOS WinBox

Interface List

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

+ - X Detect Internet Find

Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	FP Rx	FP T
R LoopBack	Bridge	1500	65535	0 bps	0 bps	0	0	0 bps	0 bps	
R ether1	Ethernet	1500	1600	0 bps	0 bps	0	0	0 bps	0 bps	
R sfp1 - MTX 1	Ethernet	1500	1580	49.2 Mbps	159.5 Mbps	18 393	19 660	49.2 Mbps	159.5 Mbps	
R sfp2 - MTX 2	Ethernet	1500	1580	0 bps	28.0 Mbps	0	3 676	0 bps	28.0 Mbps	
R sfp3 - GGC ABCOM 1	Ethernet	1500	1580	23.0 Mbps	765.9 Mbps	28 617	67 926	23.0 Mbps	765.9 Mbps	
R sfp4 - CONC 2	Ethernet	1500	1580	336.5 Mbps	31.6 Mbps	32 602	17 307	336.5 Mbps	31.6 Mbps	
R sfp5 - AT	Ethernet	1500	1580	4.2 Mbps	21.9 Mbps	979	2 317	4.2 Mbps	21.9 Mbps	
R vlan235_Menaxhim_AT_PROJECT	VLAN	1500	1576	4.8 kbps	5.0 kbps	2	2	0 bps	5.0 kbps	
R vlan236-AT_Project	VLAN	1500	1576	0 bps	0 bps	0	0	0 bps	0 bps	
R vlan_ALBIX	VLAN	1500	1576	4.1 Mbps	5.7 Mbps	805	570	0 bps	5.7 Mbps	
R vlan_AT_INTERNET	VLAN	1500	1576	117.5 kbps	16.5 Mbps	190	1 781	0 bps	16.5 Mbps	
R sfp6 - MAIN ROUTER	Ethernet	1500	1580	278.9 Mbps	27.1 Mbps	28 836	17 487	278.9 Mbps	27.1 Mbps	
R sfp7 - CONC 1	Ethernet	1500	1580	365.1 Mbps	22.8 Mbps	36 323	17 516	365.1 Mbps	22.8 Mbps	
R sfp8-SwitchOS	Ethernet	1500	1580	1224.3 kbps	1092.2 kbps	1 304	1 144	1224.3 kbps	1092.2 kbps	
X vlan_CONC 1	VLAN			0 bps	0 bps	0	0	0 bps	0 bps	
X vlan_CONC 2	VLAN			0 bps	0 bps	0	0	0 bps	0 bps	
X vlan_Servers	VLAN			0 bps	0 bps	0	0	0 bps	0 bps	

17 items

Konfigurime te per gjithshme te ISP

- ▶ Rutimet e per gjithshme
- ▶ Pse konfigurimet PPPoE ?
- ▶ Billing, authentication dhe API



▶ Pse PPPoE?

- pppoe eshte nje protokoll “point-to-point”mbi ethernet, qe mund te lidhe nje host me nje koncentrator te larget perms nje “Ethernet bridge” te theshte.
- PPPoE eshte jo vetem nje karakteristike e Ethernet por eshte gjithashtu nje tunel shume I mire I familjes PPP
- PPPoE kontrollon ne menyre te thjeshte nese useri eshte offline nepermjet stabilizimit te sesionit PPP dhe lejon kalimin e trafikut bazuar ne informacione statistikore ose billing.
- PPPoE ofron nje alokim dinamit te adresave IP. Perdoruesit nuk kane nevoje per konfigurime te nderlikuara dhe mirembajtja e rrjetit eshte e thjeshte.
- PPP perfshin nje hap autentifikimi para vendosjes sesionit. Me PPPoE, klientit I nevojitet nje “username” dhe “password” ne menyre qe te lidhet me paisjen tuaj. Askush nuk mund te logohet ne rrjet nese ne nuk e lejojme.

BILLING - SPLYNX



Filter...

Dashboard

Tariff plans

Customers

Finance

Inventory

Networking

Support

Voice

Administration

Dashboard

Welcome, Elisa Cuko!



2537

Online customers!



0

New Customers!



0

New & Open tickets!



3

Devices down!

View

View

View

View

System status

CPU Cores

8

Customers

Customers total

2944

? elisacuko



Filter...

Dashboard

Tarif

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Add

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V

V

N

Fin

Inv

Ne

Support

Usage by days

4.0GB

Up Down

[Customers / View / genibezati \(genibezati - 121\)](#)[Information](#) [Services](#) [Billing](#) [Statistics](#) [Documents](#) [CPE](#)

Title

sxt

IP/Host

172.16.148.247

Login (API)

[Show](#)

Port (API)

8728

Type

MikroTik

QoS / Shaping



QoS Target

192.168.88.0/24

Service

10/5_ Standard ()

Signal Strength



-38 dBm

[Log](#) [Save](#)

Projekte te tjera bazuar mbi Mikrotik

- ▶ Hotspot Networks project based and customer
- ▶ Shembuj konfigurimesh
- ▶ VPN concentrators per rrjetat satelitore
- ▶ Integrime me operatore te tjere telekomunikacioni
- ▶ Integrimi i Mikrotik ne meanxhimin e rrjetave te Fibrave Optike



Vodafone WiFi

Internet i shpejtë dhe i sigurtë

Dergo **SMS falas** me tekst **WiFi** tek **50222** dhe vendos numrin e telefonit dhe fjalëkalimin që do të merrni përkatësisht me poshtë.

Power to you



Identifikohu

Numri i telefonit (003556xxxxxxxx)

admin

Duke dërguar SMS më sipër ju bini dakort me kushtet dhe afatet e Vodafone WiFi.

Fjalëkalimi

Harruat fjalëkalimin?

.....

Pranoj Termat dhe Kushtet

Lidhu

Klient jo Vodafone?

Identifikohu me Facebook



Internet i shpejtë dhe i sigurtë

Dergo **SMS falas** me tekst **WiFi** tek **50222** dhe vendos numrin e telefonit dhe fjalëkalimin që do të merrni përkatësisht me poshtë.
Power to you

Identifikohu

Numri i telefonit (003556xxxxxxxx)

admin

Duke dërguar SMS më sipër ju bini dakort me kushtet dhe afatet e Vodafone WiFi.

Fjalëkalimi

Harruat fjalëkalimin?

.....

Pranoj Termat dhe Kushtet

Lidhu

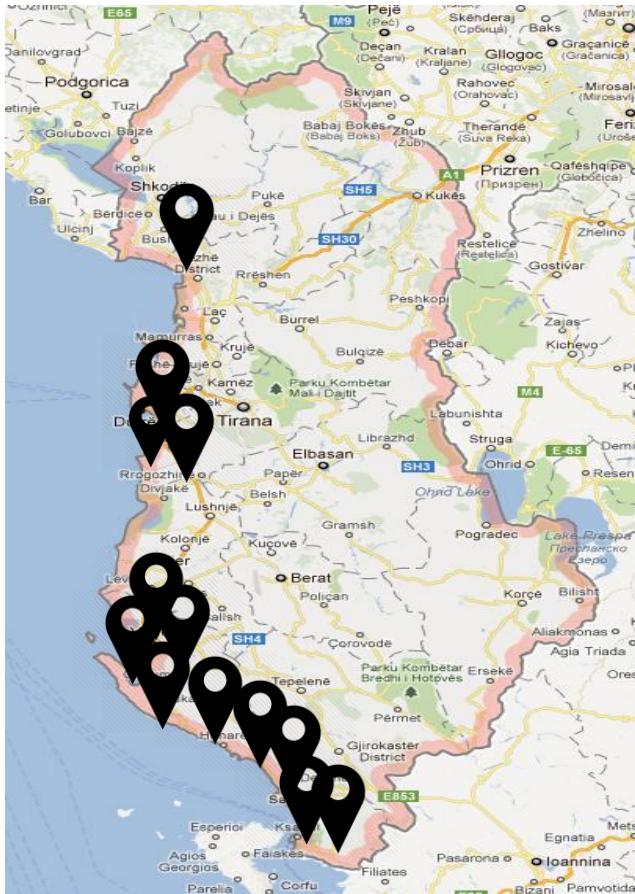
Klient jo Vodafone?
Identifikohu me Facebook





HotSpot Network Manager

Vodafone Summer Wi-Fi



- Routerboard RB850Gx2



AP: SXT 2.4 GHz

Klientët e zakonshem: Proper Pizza

proper
pizza

PROPER WiFi

Mirë se erdhët në restorantin e Proper Pizza
Ju mund te lundroni falas në internet duke u identifikuar nëpërmjet një llogarie tuaj ekzistuese në një prej rrjetave sociale, ose duke u regjistruar nga fillimi.

Sign in or register with:

[Facebook](#)

[Instagram](#)

Not subscribed to a social network?

Register

Welcome

Complete Credentials

Email

Password

Start Browsing

[Privacy policy](#)

proper
pizza

Powered by Vodafone

i

→

proper
pizza

Menu

Dashboard

Manager's Dashboard: Proper Pizza



Connections
Period Values

5 457
-35.44%

Traffic
Period Values

590.6 GB
-23.47%

New Users
Period Values

1 282
-44.72%

Clicks
Period Values

0
--%

Impressions
Period Values

0
--%

CTR
Period Values

--.%
--.%

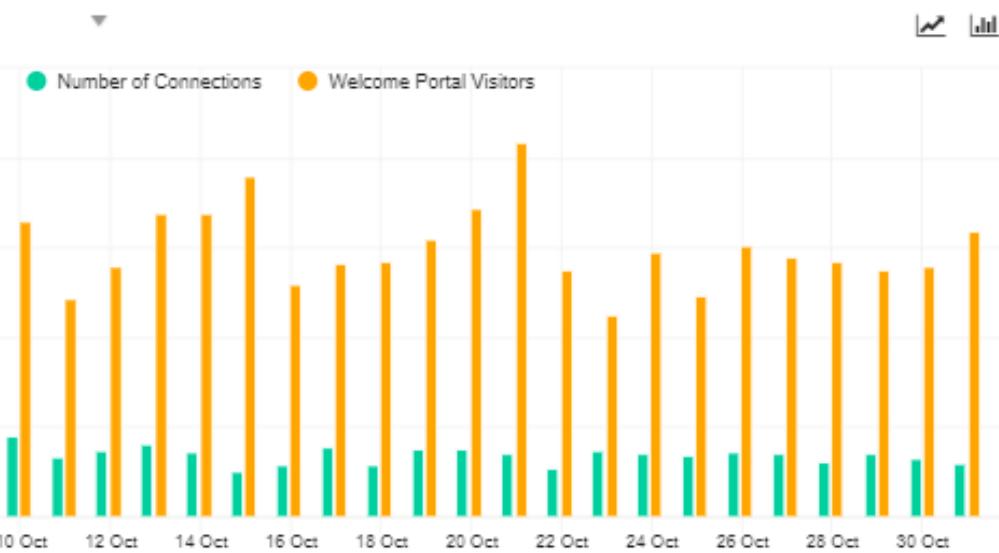
GW Sold
Period Values

0
--.%

Adv sold
Period Values

Lek 0
--.%

Number of Connections and Visitors



User Count by Domain

Period Values



Context data

Total Values (Discounted Amounts)

Number of Registered Gateways
Number of Registered Users
Number of Activated Users
Total Number of Connections
Count of Active Gateways

Top Domain Connections

Period Values

ProperPizza

5 457

Top User Traffic

Period Values

User	Domain	Traffic
erintafaa7@yahoo.it	ProperPizza	25.9 GB
Arseinsokoli111@gmail.com	Proper	20.84 GB
QMX4WS@ProperPizza		17.1 GB
ZPY4TV@ProperPizza		15.63 GB
EliaM104@ProperPi		15.42 GB

Gateway: hAP Lite ac



AP: 1 use 2 WAP AC



Trajnimet

15 Kolege
te trajnuar

Perfitimet e
stafit nga
Trajnimit

Perfitimet e
Starnet nga
trajnimet

Perfundime:

- Krahasimi i biznesit te ISP me garen dhe roli i mikrotik ne kete gare
- Cdo projekt eshte nje maratone
- Duhen veshjet e duhura qe jane paisjet e duhura
- Duhet stervitja qe jane Trajnimet
- Duhet edhe nje grup shokesh qe do mbeshtesin sfiden tende
- Mikrotik eshte skuadra qe do iu mbeshtese ne cdo projekt tuajin



Faleminderit!!

