



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

How to build an ISP business with Mikrotik Only

STARNET SH.P.K

Wireless Internet Service Provider

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 pergjithshme 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:



Profil I themeluesit :

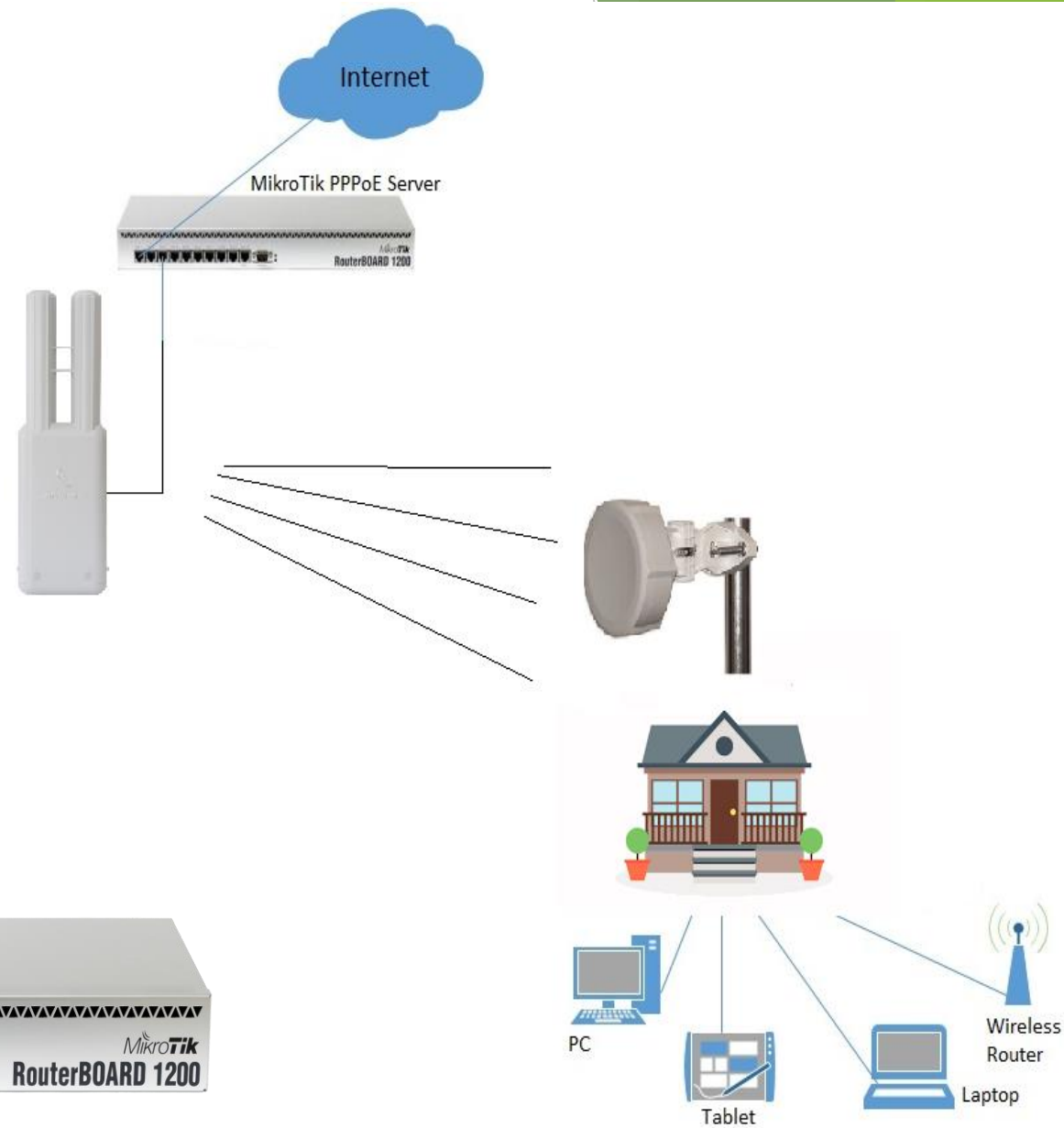


- ▶ Kam studiuar Fakulteti I Shkencave te Natyres
- ▶ Aktiv ne fushen e telekomunikacionit qe prej vitit 2000
- ▶ Themelues:
 - ▶ Starsat-International
 - ▶ Starnet ne 2014
- ▶ MikroTik Certified
 - ▶ MTCNA
 - ▶ MTCRE
 - ▶ MTCINE

STARNET! Si filloi gjithcka?

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

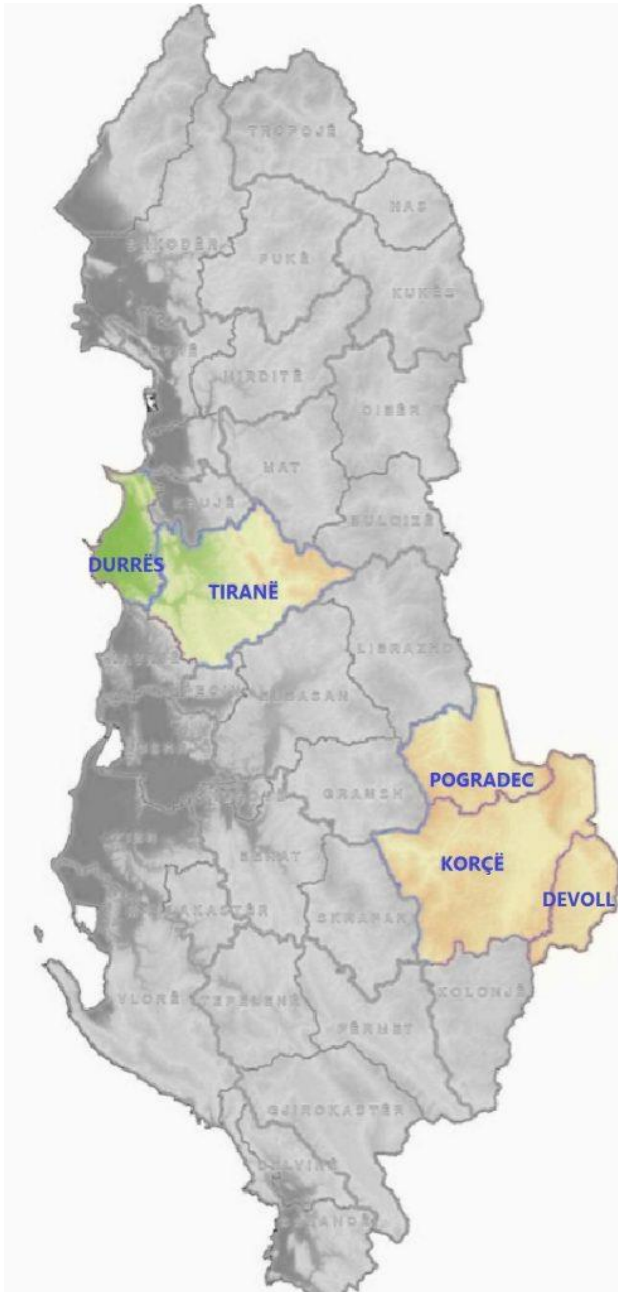
(te cilet jane akoma edhe sot funksionale dhe ne pune)



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 konfiguruarra 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

Konfigu

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	05:9
HT20-6	-64	00:0
9Mbps	-63	10:9
18Mbps	-63	09:0
36Mbps	-63	00:0
HT20-0	-63	10:4
HT20-1	-63	10:3
HT20-2	-63	04:9
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

Default Authent

Multicast Helper: default

Multicast Bufferin

Keepalive Frame

enabled running slave connected to e

Interface <wlan1>

Nstreme NV2 Tx Power Current Tx Power Advanced Status ...

Security

Preshared Key: st@rvo

OK

Cancel

Apply

Interface <pppoe-out1>

General Dial Out Status Traffic

Service: [dropdown]

AC Name: [dropdown]

User: rolandvulka

Password: rolandvulka

Profile: default

Keepalive Timeout: 10

Dial On Demand

Use Peer DNS

Add Default Route

Default Route Distance: 0

Allow: mschap2 mschap1

chap pap

OK

Cancel

Apply

Disable

Comment

Copy

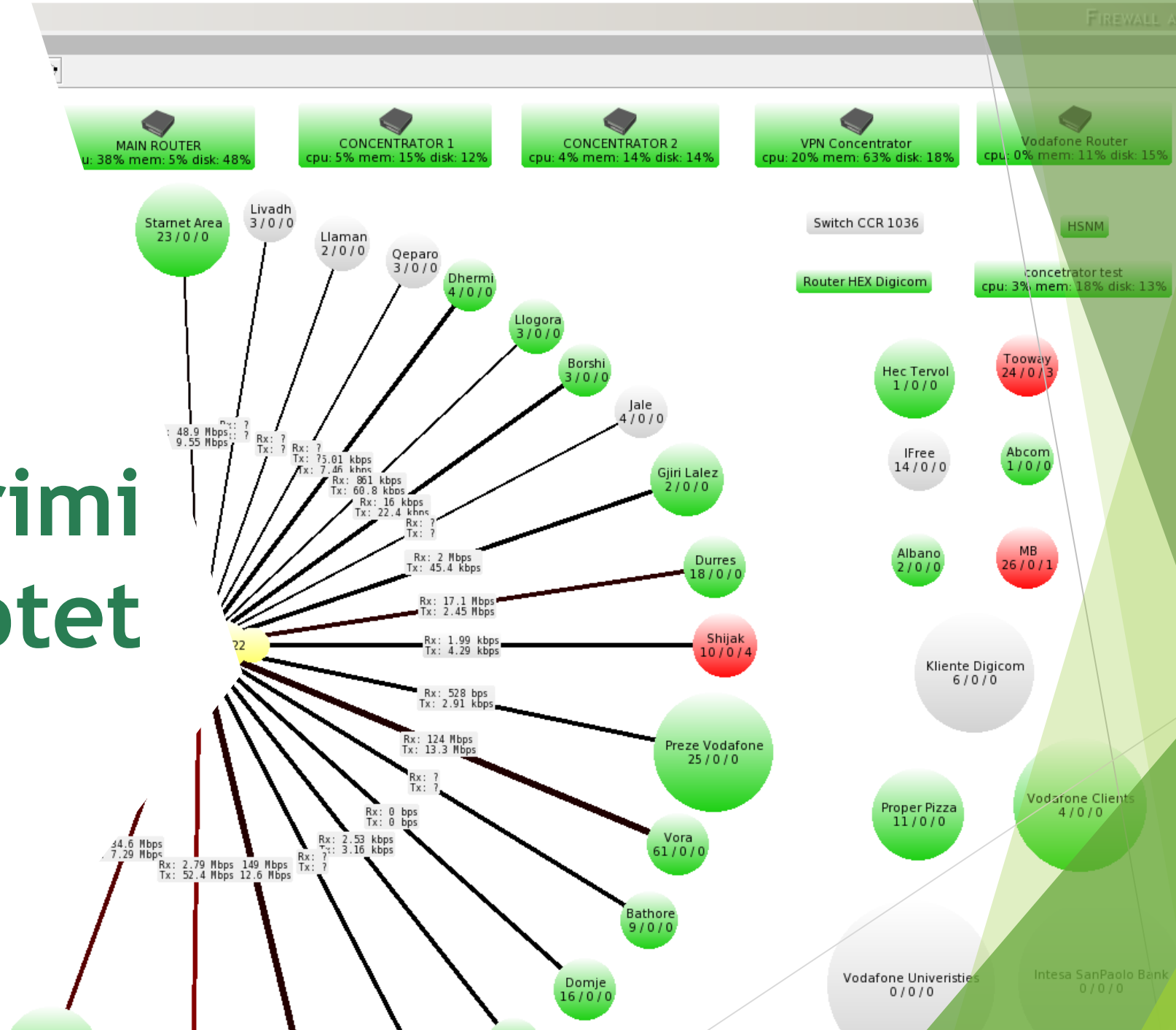
Remove

Torch

PPPoE Scan

enabled running slave Status: connected

Monitorimi dhe scriptet



- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- IPv6
- Routing
- System
- Queues
- Files
- Log
- Radius
- Tools
- New Terminal
- LCD
- Partition
- Make Supout.rtf
- Manual
- New WinBox

Interface List

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

Find

	Name	Type	Actual MTU	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
	sfp1	Ethernet	1500	1600	0 bps	0 bps	0	0
S	ether10	Ethernet	1500	1598	0 bps	0 bps	0	0
S	ether9	Ethernet	1500	1598	0 bps	0 bps	0	0
	::: Hink 2							
RS	ether8	Ethernet	1500	1598	904 bps	0 bps	1	0
	::: Link Stropcke 2							
RS	ether7	Ethernet	1500	1598	9.1 Mbps	646.4 kbps	806	360
	::: SXT Gurras							
RS	ether6	Ethernet	1500	1598	0 bps	0 bps	0	0
	::: Hink 3							
RS	ether5	Ethernet	1500	1598	18.9 Mbps	1679.5 kbps	1 741	945
	::: Sar Tushemisht							
RS	ether4	Ethernet	1500	1598	0 bps	0 bps	0	0
	::: Hink 1							
RS	ether3	Ethernet	1500	1598	38.2 Mbps	2.1 Mbps	3 504	1 684
S	ether2	Ethernet	1500	1598	0 bps	0 bps	0	0
	::: Hyrja DATA							
R	ether1	Ethernet	1500	1598	4.7 Mbps	70.4 Mbps	3 023	6 487
R	PPPoE_Bridge	Bridge	1500	1598	55.3 Mbps	4.3 Mbps	5 138	3 035
DR	pppoe-yllsondenvishaj	PPPoE Server Binding	1480		0 bps	0 bps	0	0

92 items

Paisjet ne kulla

- ▶ Qendrushmeria e paisjeve ne kulla
- ▶ Ruterat qe perdorim 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



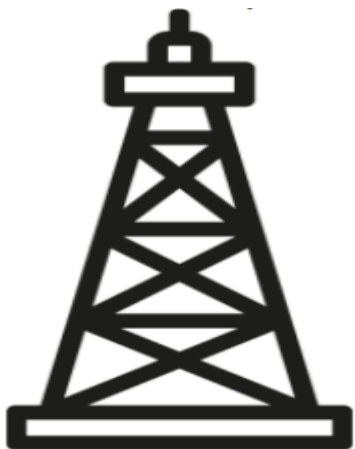
Routerboard Hex lite
or similar 1xCPU

Kulle e vogel
~40 kliente



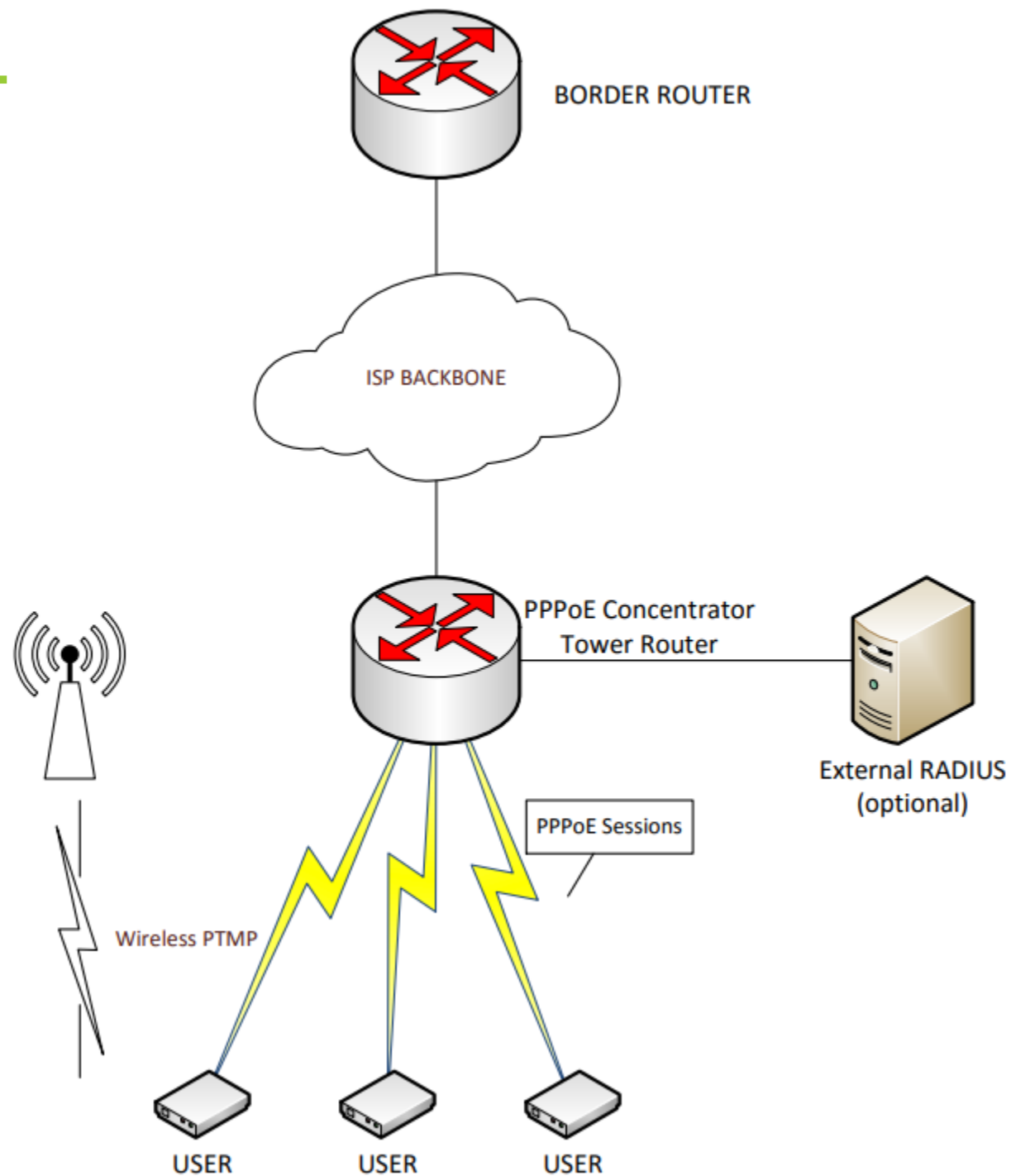
Routerboard Hex/RB3011

Kulle e mesme
~100 kliente



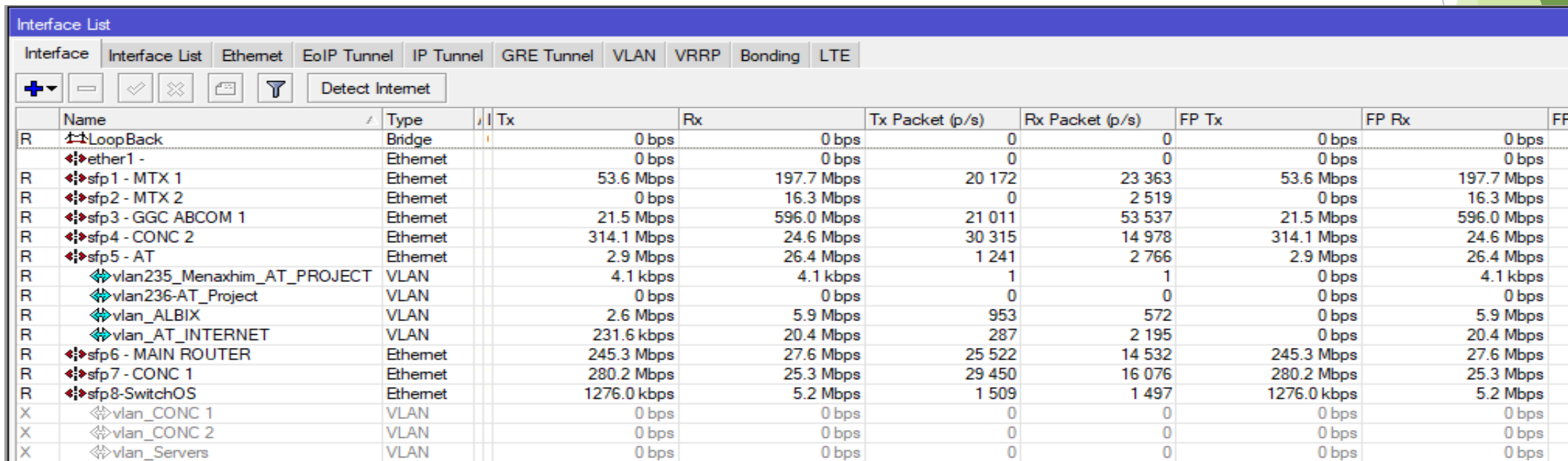
RB1100AHx2; CCR1009

Kulle e madhe
>100 kliente



Backbone dhe Core

- ▶ SFP Mikrotik dhe rezultatet e deri tanishme
- ▶ Shembuj te nderfaqesimit ne situatat 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



The screenshot shows the 'Interface List' window in Mikrotik WinBox. The window has a blue header and a toolbar with various icons and a 'Detect Internet' button. Below the toolbar is a table with columns for Name, Type, Tx, Rx, Tx Packet (p/s), Rx Packet (p/s), FP Tx, FP Rx, and FP. The table lists various interfaces, including LoopBack, ether1, and several SFP interfaces (sfp1-sfp8) and VLANs. The SFP interfaces show significant traffic, with sfp8-SwitchOS having the highest Tx traffic at 1276.0 kbps.

Name	Type	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	FP Rx	FP
LoopBack	Bridge	0 bps	0 bps	0	0	0 bps	0 bps	0 bps
ether1 -	Ethernet	0 bps	0 bps	0	0	0 bps	0 bps	0 bps
sfp1 - MTX 1	Ethernet	53.6 Mbps	197.7 Mbps	20 172	23 363	53.6 Mbps	197.7 Mbps	0 bps
sfp2 - MTX 2	Ethernet	0 bps	16.3 Mbps	0	2 519	0 bps	16.3 Mbps	0 bps
sfp3 - GGC ABCOM 1	Ethernet	21.5 Mbps	596.0 Mbps	21 011	53 537	21.5 Mbps	596.0 Mbps	0 bps
sfp4 - CONC 2	Ethernet	314.1 Mbps	24.6 Mbps	30 315	14 978	314.1 Mbps	24.6 Mbps	0 bps
sfp5 - AT	Ethernet	2.9 Mbps	26.4 Mbps	1 241	2 766	2.9 Mbps	26.4 Mbps	0 bps
vlan235-Menaxhim_AT_PROJECT	VLAN	4.1 kbps	4.1 kbps	1	1	0 bps	4.1 kbps	0 bps
vlan236-AT_Project	VLAN	0 bps	0 bps	0	0	0 bps	0 bps	0 bps
vlan_ALBIX	VLAN	2.6 Mbps	5.9 Mbps	953	572	0 bps	5.9 Mbps	0 bps
vlan_AT_INTERNET	VLAN	231.6 kbps	20.4 Mbps	287	2 195	0 bps	20.4 Mbps	0 bps
sfp6 - MAIN ROUTER	Ethernet	245.3 Mbps	27.6 Mbps	25 522	14 532	245.3 Mbps	27.6 Mbps	0 bps
sfp7 - CONC 1	Ethernet	280.2 Mbps	25.3 Mbps	29 450	16 076	280.2 Mbps	25.3 Mbps	0 bps
sfp8-SwitchOS	Ethernet	1276.0 kbps	5.2 Mbps	1 509	1 497	1276.0 kbps	5.2 Mbps	0 bps
vlan_CONC 1	VLAN	0 bps	0 bps	0	0	0 bps	0 bps	0 bps
vlan_CONC 2	VLAN	0 bps	0 bps	0	0	0 bps	0 bps	0 bps
vlan_Servers	VLAN	0 bps	0 bps	0	0	0 bps	0 bps	0 bps

- Quick Set
- Interfaces
- Bridge
- Mesh
- IP
- Routing
- System
- Queues
- Files
- Log
- Radius
- Tools
- New Terminal
- LCD
- Partition
- Make Supout.rif
- Manual
- New WinBox
- Exit

Interface List												
Interface Interface List Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE												
+ - [Icons] 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	0 bps	
	ether1 -	Ethernet	1500	1600	0 bps	0 bps	0	0	0 bps	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	0 bps	
R	sfp2 - MTX 2	Ethernet	1500	1580	0 bps	28.0 Mbps	0	3 676	0 bps	28.0 Mbps	0 bps	
R	sfp3 - GGC ABCOM 1	Ethernet	1500	1580	23.0 Mbps	765.9 Mbps	28 617	67 926	23.0 Mbps	765.9 Mbps	0 bps	
R	sfp4 - CONC 2	Ethernet	1500	1580	336.5 Mbps	31.6 Mbps	32 602	17 307	336.5 Mbps	31.6 Mbps	0 bps	
R	sfp5 - AT	Ethernet	1500	1580	4.2 Mbps	21.9 Mbps	979	2 317	4.2 Mbps	21.9 Mbps	0 bps	
R	vlan235_Menaxhim_AT_PROJECT	VLAN	1500	1576	4.8 kbps	5.0 kbps	2	2	0 bps	5.0 kbps	0 bps	
R	vlan236-AT_Project	VLAN	1500	1576	0 bps	0 bps	0	0	0 bps	0 bps	0 bps	
R	vlan_ALBIX	VLAN	1500	1576	4.1 Mbps	5.7 Mbps	805	570	0 bps	5.7 Mbps	0 bps	
R	vlan_AT_INTERNET	VLAN	1500	1576	117.5 kbps	16.5 Mbps	190	1 781	0 bps	16.5 Mbps	0 bps	
R	sfp6 - MAIN ROUTER	Ethernet	1500	1580	278.9 Mbps	27.1 Mbps	28 836	17 487	278.9 Mbps	27.1 Mbps	0 bps	
R	sfp7 - CONC 1	Ethernet	1500	1580	365.1 Mbps	22.8 Mbps	36 323	17 516	365.1 Mbps	22.8 Mbps	0 bps	
R	sfp8-SwitchOS	Ethernet	1500	1580	1224.3 kbps	1092.2 kbps	1 304	1 144	1224.3 kbps	1092.2 kbps	0 bps	
X	vlan_CONC 1	VLAN			0 bps	0 bps	0	0	0 bps	0 bps	0 bps	
X	vlan_CONC 2	VLAN			0 bps	0 bps	0	0	0 bps	0 bps	0 bps	
X	vlan_Servers	VLAN			0 bps	0 bps	0	0	0 bps	0 bps	0 bps	

Konfigurime te pergjithshme te ISP

- ▶ Rutimet e pergjithshme
- ▶ 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 nevojte 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! View	 0 New Customers! View	 0 New & Open tickets! View	 3 Devices down! View
-----------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------

System status

CPU Cores	8
-----------	---

Customers

Customers total	2944
-----------------	------

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)

admin

Password (API)

Show

Port (API)

8728

Type

MikroTik

QoS / Shaping



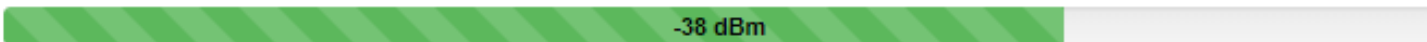
QoS Target

192.168.88.0/24

Service

10/5_15000_Standard ()

Signal Strength



Log

Save



Projekte te tjera bazuar mbi Mikrotik

- ▶ Hotspot Networks project based and customer
- ▶ Shembuj konfigurimesh
- ▶ VPN concentrators per rrjetat satelitore
- ▶ Integrimi me operatore te tjere telekomunikacioni
- ▶ Integrimi i Mikrotik ne meanzhimin 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 (003556xxxxxxx)

admin

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

Fjalëkalimi [Harruat fjalëkalimin?](#)

.....

Pranoj [Termet 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 (003556xxxxxxx)

admin

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

Fjalëkalimi [Harruat fjalëkalimin?](#)

.....

Pranoj [Termet dhe Kushtet](#)

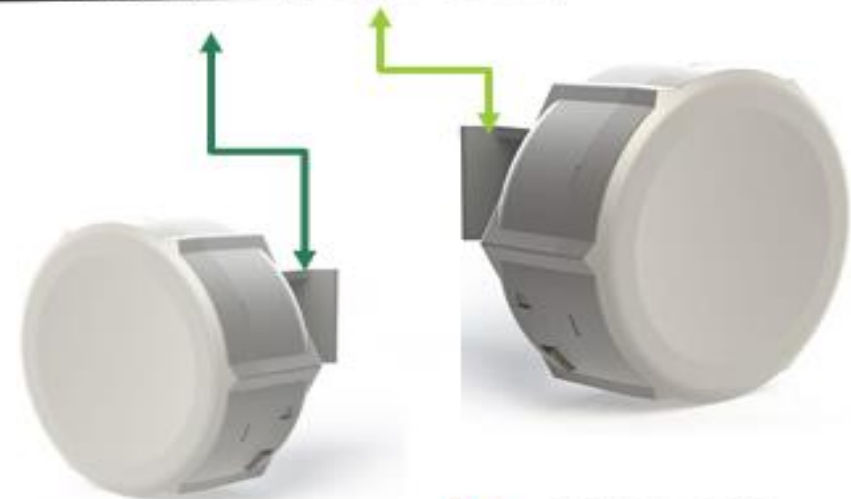
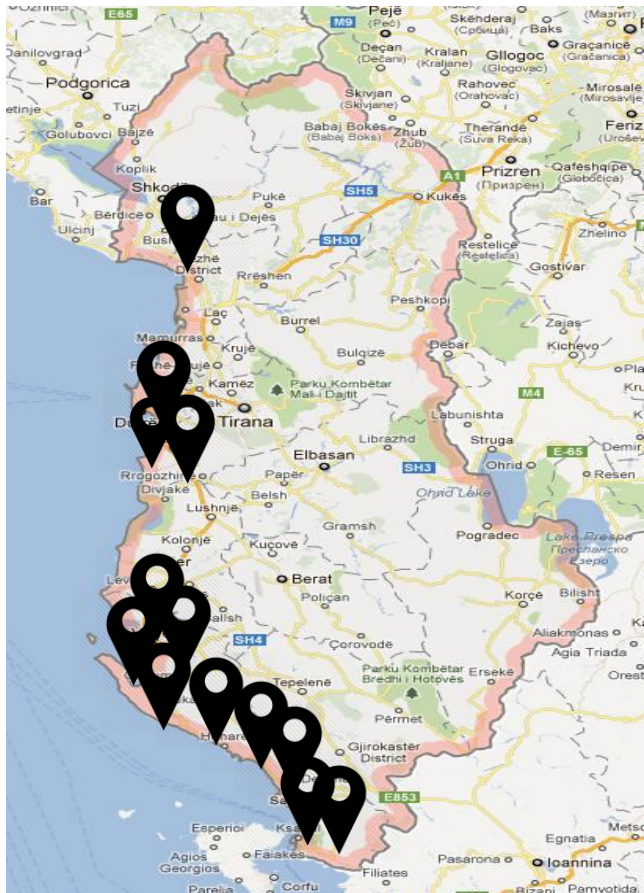
Lidhu

Klient jo Vodafone?
Identifikohu me Facebook



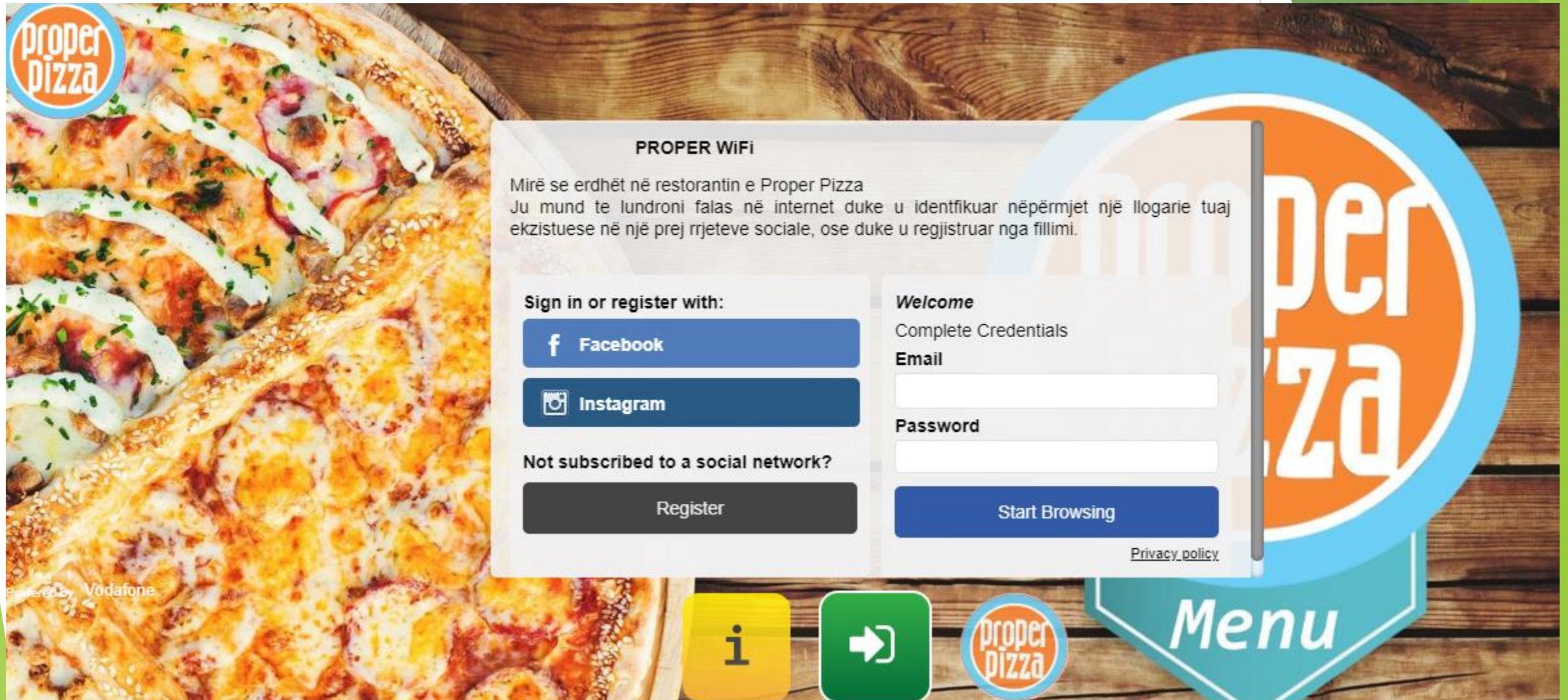
Vodafone Summer Wi-Fi

- Routerboard RB850Gx2



AP: SXT 2.4 GHz

Kliente te zakonshem: Proper Pizza



proper pizza

PROPER WiFi

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

Sign in or register with:

f Facebook

Instagram

Not subscribed to a social network?

Register

Welcome
Complete Credentials

Email

Password

Start Browsing

[Privacy_policy](#)

Menu

i **➔** **proper pizza**

Powered by Vodafone



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

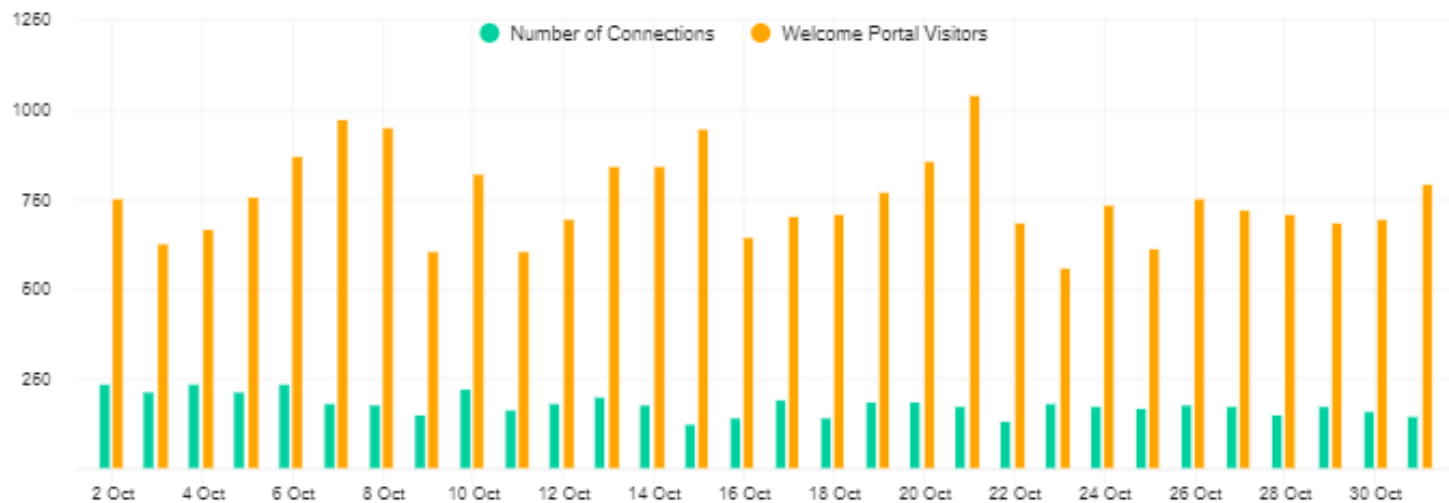
0
---%

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	1
Number of Registered Users	33 551
Number of Activated Users	1
Total Number of Connections	109 977
Cost of connections sold by the	1 110 000

Top Domain Connections

Period Values

ProperPizza 5 457

Top User Traffic

Period Values

ervintafa7@yahoo.it@ProperPizza	25.9 GB
Arsenokoli111@gmail.com@Proper	20.84 GB
QMX4WS@ProperPizza	17.1 GB
ZPY4TV@ProperPizza	15.63 GB
...	...

Gateway: hAP Lite ac



AP: 1 ose 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
- Duhet 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!!

