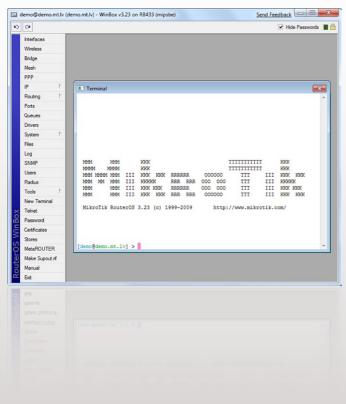
### Feature catalog







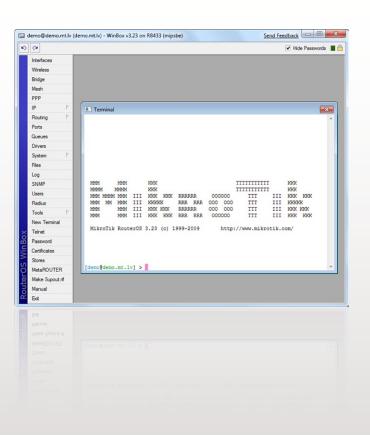
MikroTik RouterOS is the operating system of MikroTik RouterBOARD hardware.

It can also be installed on a PC and will turn it into a router with all the necessary features - routing, firewall, bandwidth management, wireless access point, backhaul link, hotspot gateway, VPN server and more.

RouterOS is a stand-alone operating system based on the Linux v2.6 kernel, and our goal here at MikroTik is to provide all these features with a quick and simple installation and an easy to use interface.

You can try RouterOS today, go to www.mikrotik.com and download the installation CD image. The free trial provides all of the features with no limitations.

In the following pages you will find examples of some of the most important RouterOS features.





### Hardware

RouterOS is the operating system provided with MikroTik RouterBOARD devices, but it can also be installed on PCs and other X86 compatible hardware devices, like embedded boards and miniITX systems.

RouterOS is now built upon the Linux v2.6 kernel and supports multi-core and multi-CPU computers (SMP). You can run it on the latest and greatest Intel motherboards and use the newest multicore CPUs.

RouterOS supports installation on IDE, SATA and USB storage devices, this includes HDDs, CF and SD cards, SDD disks and more. You need at least 64MB of space to install RouterOS, which will format your partition and become the default operating system of the device it's in.

Of course RouterOS has a multitude of supported network interfaces, including the latest 10 Gigabit ethernet cards, 802.11a/b/g/n wireless cards and 3G modems.

								$\otimes$
		I	iterface	es				
		fault gatew idge interfa		.3.1				
	Name	Type		guration	Graph	1		
	ether1	ether	et enable	ed	graph	1		
	ether2	ether	et 192.1	58.212.1/24	graph	1		
	ether3	ether	et 192.10	58.213.1/24	graph	1		
	wlan1-u	plink wirele	ss 66.22	8.113.24/32	graph	1		
	wlan2-s	t2 wirele	ss 66.22	8.113.24/32	graph	]		
	wlan3-a	p1 wirele	ss 66.22	8.113.24/32	graph	1		

MikroTik

radius Radius client settings redo Redo previosly undone action routing setup Do basic setup of system smmp SNMP settings special-login Special login users store tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati	🛃 demo.mt.lv - PuTTY			Send	d Feedback	- O <b>X</b>
<pre>quit Quit console radius Radius client settings redo Redo previosly undone action routing setup Do basic setup of system smmp SNMP settings special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # O wlan3-ap1 000C4218551A 00:0C:42:18:551A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	ppp Point to Point H	Protocol				~
<pre>radius Radius client settings redo Redo previosly undone action routing setup Do basic setup of system smmp SNMP settings special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE 0 wlan3-ap1 000C4218551A 00.5C4218551A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	queue Bandwidth mana	agement				
<pre>redo Redo previosly undone action routing setup Do basic setup of system smpp SNMP settings special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	quit Quit console					
<pre>routing setup Do basic setup of system snmp SNMP settings special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print</pre>	radius Radius client	t settings				
<pre>setup Do basic setup of system smmp SNMP settings special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # UNDERFACE NADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # UNDERFACE NADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # UNDERFACE NADIO-NAME MAC-ADDRESS AP SIGNAL S4Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	redo Redo previosly	undone action				
<pre>smmp SNMP settings special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADRESS AP SIGNAL TX-RATE U 0wlan3-ap1 000C4218551A 00:C142:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:CC:42:05:01:27 yes -65dBm 54Mbps</pre>	routing					
<pre>special-login Special login users store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00.0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	setup Do basic setur	o of system				
<pre>store system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	snmp SNMP settings					
<pre>system tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE # unal_spl 000C4218551A 00:CC:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:CC:42:05:01:27 yes -65dBm 54Mbps</pre>	special-login Specia	al login users				
<pre>tool Diagnostics tools undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	store					
<pre>undo Undo previous action user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	system					
<pre>user export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	tool Diagnostics too	ols				
<pre>export Print or save an export script that can be used to restore configurati on [demo@demo.mt.lv] &gt; interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps</pre>	undo Undo previous a	action				
on [demo@demo.mt.lv] > interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps	user					
[demo@demo.mt.lv] > interface wireless registration-table print # INTERFACE RADIO-NAME MAC-ADDRESS AP SIGNAL TX-RATE E 0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps	export Print or save	e an export scrip	ot that can be used	to	restore cor	nfigurati
# INTERFACE         RADIO-NAME         MAC-ADDRESS         AP         SIGNAL         TX-RATE         D           0 wlan3-ap1         000C4218551A         00:0C:42:18:55:1A         no         -69dBm         54Mbps           1 wlan2-st2         000C42050127         00:0C:42:05:01:27         yes         -65dBm         54Mbps	on					
# INTERFACE         RADIO-NAME         MAC-ADDRESS         AP         SIGNAL         TX-RATE         D           0 wlan3-ap1         000C4218551A         00:0C:42:18:55:1A         no         -69dBm         54Mbps           1 wlan2-st2         000C42050127         00:0C:42:05:01:27         yes         -65dBm         54Mbps						
# INTERFACE         RADIO-NAME         MAC-ADDRESS         AP         SIGNAL         TX-RATE         D           0 wlan3-ap1         000C4218551A         00:0C:42:18:55:1A         no         -69dBm         54Mbps           1 wlan2-st2         000C42050127         00:0C:42:05:01:27         yes         -65dBm         54Mbps						
0 wlan3-ap1 000C4218551A 00:0C:42:18:55:1A no -69dBm 54Mbps 1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps						
1 wlan2-st2 000C42050127 00:0C:42:05:01:27 yes -65dBm 54Mbps						
	-					-
2 wlan1-uplink 000B6B4D461F 00:0B:6B:4D:46:1F yes -26dBm 54Mbps				-		-
		000B6B4D461F	00:0B:6B:4D:46:1F	yes	-26dBm	54Mbps
[demo@demo.mt.lv] >	[demo@demo.mt.lv] >					*

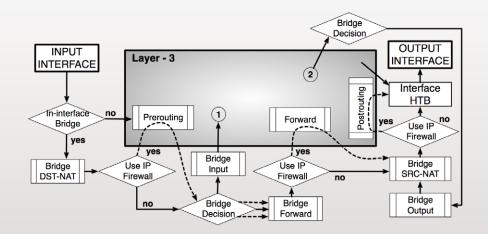
# Configuration

RouterOS supports various methods of configuration - local access with keyboard and monitor, serial console with a terminal application, Telnet and secure SSH access over networks, a custom GUI configuration tool called Winbox, a simple Web based configuration interface and an API programming interface for building your own control application. In case there is no local access, and there is a problem with IP level communications, RouterOS also supports a MAC level based connection with the custom made Mac-Telnet and Winbox tools.

RouterOS features a powerful, yet easy to learn commandline configuration interface with integrated scripting capabilities.

- Winbox GUI over IP and MAC
- CLI with Telnet, SSH, Local console and Serial console
- API for programming your own tools
- Web interface





### Firewall

The firewall implements packet filtering and thereby provides security functions, that are used to manage data flow to, from and through the router. Along with the Network Address Translation it serves for preventing unauthorized access to directly attached networks and the router itself as well as a filter for outgoing traffic.

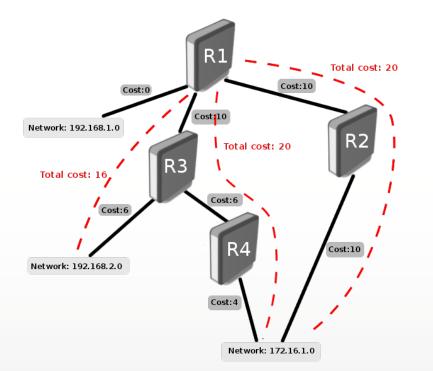
RouterOS features a stateful firewall, which means that is performs stateful packet inspection and keeps track of the state of network connections traveling across it.

It also supports Source and Destionation NAT (Network Address Translation), NAT helpers for popular applications and UPnP.

The Firewall provides features to make use of internal connection, routing and packet marks.

It can filter by IP address, address range, port, port range, IP protocol, DSCP and other parameters, also supports Static and Dynamic Address Lists, and can match packets by pattern in their content, specified in Regular Expressions, called Layer7 matching.

The RouterOS Firewall facility also supports IPv6.



nin@10.5.8	120 (MikroTil	k) - WinBo	x v3.23 on R	B333 (powerpo					Send Fe	edback	
×.							5d 04:03:34	Memory: 47.3 MIB	CPU: 5%	Hide P	assword
nterfaces											
Wireless											
Bridge											
Mesh											
PPP											
P	1										
	12	III OSF	PF								х
MPLS	_	Areas	Area Rannes	Virtual Linke	Neighbore	NBMA Neighbors	LSA Routes	AS Border Bou	tere OSPE	Routere	
VPLS		1.1	7400 Hungos	THEOREM IN THE	regristera	The second s	Tiouroa	75 001001 1100			
IPv6	1	T								Find	
Routing	1			ca	∠ Type	ID	Originator	Sequence Nu			-
-			default			10.1.101.0	10.255.255.3	80000269			
Ports			default			192.0.2.1	10.255.255.3	8000073c			
Queues			default		as external		172.16.0.1	80000011			_
Drivers	_		default			32.32.1.1	172.16.0.1	8000000a			
	_		default			10 255 255 1	172.16.0.1	8000073			
System	P		default			10.255.255.3	10.255.255.3	8000073c			
Files			dofault default			44.44.1.1 10.255.255.2	172.16.0.1 172.16.0.9	800000a 8000073c			
	_		default		as external as external		172.16.0.9	80000/3c 800004d3			
Log			default			10.5.8.0	172.16.0.1	800004d3 800000a			
SNMP			default		as external as external		10.255.255.3	8000008			
Users	_			ckbone	router	172.16.0.9	172.16.0.9	8000026a			
	_			ckbone	router	172.16.0.1	172.16.0.1	80000755			
Radius				ckbone	unknown	1.0.0.0	172.16.0.9	8000073c			-
Tools	1			ckbone	network	172 16 0 9	172.16.0.9	800000rsc			
				ckbone	unknown	1.0.0.0	172.16.0.1	8000073			
New Terminal				ckbone	network	172.16.0.6	172.16.0.9	800000FG			
Telnet		1	default ba	ockbone	router	10.255.255.3	10.255.255.3	8000074c	1708		
Password		18 items	5								-
Certificates		1									
Stores											
Make Supout	et all										
Manual											
Exit											

# Routing

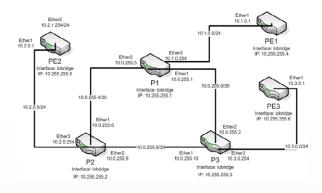
RouterOS supports static routing and a multitude of dynamic routing protocols.

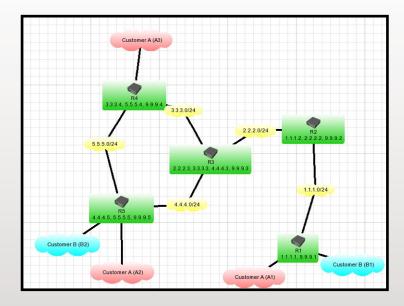
- For IPv4 it supports RIP v1 and v2, OSPF v2, BGP v4.
- For IPv6 it supports RIPng, OSPFv3 and BGP.

RouterOS also suppors Virtual Routing and Forwarding (VRF), Policy based routing, Interface based routing and ECMP routing.

You can use the Firewall filter to mark specific connections with Routing marks, and then make the marked traffic use a different ISP.

Now with MPLS support added to RouterOS, VRF is also introduced. Virtual Routing and Forwarding is a technology that allows multiple instances of a routing table to co-exist within the same router at the same time. Because the routing instances are independent, the same or overlapping IP addresses can be used without conflicting with each other. VRF also increases network security. It is often used in, but not limited to MPLS networks.





### MPLS

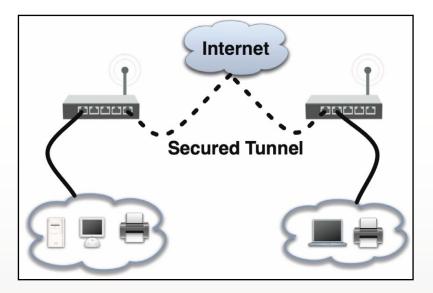
MPLS stands for MultiProtocol Label Switching. It can be used to replace IP routing - packet forwarding decision is no longer based on fields in IP header and routing table, but on labels that are attached to packet. This approach speeds up forwarding process because next hop lookup becomes very simple compared to routing lookup.

Efficency of forwarding process is the main benefit of MPLS. MPLS makes it easy to create "virtual links" between nodes on the network, regardless of the protocol of their encapsulated data.

It is a highly scalable, protocol agnostic, data-carrying mechanism. In an MPLS network, data packets are assigned labels. Packet-forwarding decisions are made solely on the contents of this label, without the need to examine the packet itself. This allows one to create end-to-end circuits across any type of transport medium, using any protocol.

Some of the supported MPLS features:

- Static Label bindings for IPv4
- Label Distribution protocol for IPv4
- RSVP Traffic Engineering tunnels
- VPLS MP-BGP based autodiscovery and signaling
- MP-BGP based MPLS IP VPN



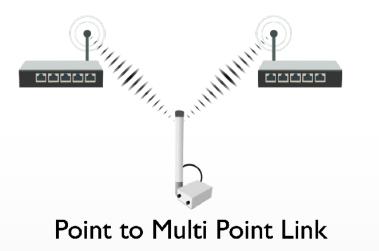
C*														5d 03:50	52 Me	mory	7.2 ME	CPU: 7%		lide F	asswor	ds
interfaces Wireless Bridge																						
Mesh		In In	terfa	ce List																		83
ppp				Bheme		- ID T.	Innel	ID Tue	-		VPP	00 0	-									
P h		-						IF IUI		-LHIN	VINE	VF E	onung									_
MPLS	-		-	*			T														Find	
VPLS	-		Name 40+eti			Typ	emet			Tx	0 bos	Rx	0 bos		. Rx P	ac 1	x Drops	Rx Drops	Tx Error	0	Errors	
Pv6 h	-	R	4)+et	her2	1		-					•	0 000				4	0		0	0	
			<b>€</b> ≯et	her3 me-ovpr				ce < pp								_	×	0		0	0	
in our g				phome ovpr	n	Gen	eral	Dial Out	Sta	tus	Traffic					0	<	0		0	0	
Ports	- 11	R	110	0			Тх	/Rx Rat	e: 01	ps		٦,	Obps		7 I I	Can	cel	0		0	Ő	
Queues			0-0pp ∰vt	tp-home	,	Ty/	Ry Par	ket Rat	. 0.	10		-	0 p/s		51	App	4.	0		0	0	
Drivers			11VE			1.00							20.0 G		511	-01	NY	0		0	0	
System 1								Rx Byte						10.100.000		Disa	ble					
Files							Tx/R	Packe	ts: 21	474	837 24	3	21474	837 265	_   i	Come	ient					
log							Tx/	Rx Drop	os: 0				0			Co						
SNMP							Tx/	Rx Erro	ns: 0				0									
Users									11						- 1	Rem	ove					
Radius		9 tem	s (1 se	elected)												Tor	ch					
Tools 1	5 L	1					Tx: (	bps										1	_	_	_	_
New Terminal							Rx: (	bps														
Teinet									-			-			-							
Password																						
Certificates							Tx Pa	cket: (	p/s													
Rores							Rx Pa	acket: (	p/s													
Make Supout of						1																
Manual	-					disab	led		runnin	19		sla	ve		Status:	conne	cted					
Hariuai Exit	-																	der.				

### VPN

To establish secure connections over open networks or the Internet, or connect remote locations with encrypted links, RouterOS supports various VPN methods and tunnel protocols:

- Ipsec tunnel and transport mode, certificate or PSK, AH and ESP security protocols
- Point to point tunneling (OpenVPN, PPTP, PPPoE, L2TP)
- Advanced PPP features (MLPPP, BCP)
- Simple tunnels (IPIP, EoIP)
- 6to4 tunnel support (IPv6 over IPv4 network)
- VLAN IEEE802.1q Virtual LAN support, Q-in-Q support
- MPLS based VPNs

This means that you can securely interconnect banking networks, use your workplace resources while travelling, connect to your home local network, or increase security of your wireless backbone link. You can even interconnect two branch office networks and they would be able to use each other's resources, as if the computers would be in the same location all secure and encrypted.





### **Dual Nstreme Link**

### Wireless

A variety of Wireless technologies are suppored in RouterOS, the most basic of them being the wireless access point and client. If it's a small hotspot network in your home, or a city wide mesh network, RouterOS will help you in all situations. Some of the features supported by RouterOS:

- IEEE802.11a/b/g/n wireless client and access point
- Nstreme and Nstreme2 proprietary protocols
- Client polling
- RTS/CTS
- Wireless Distribution System (WDS)
- Virtual AP
- WEP, WPA, WPA2 encryption
- Access control list
- Wireless client roaming
- WMM
- HWMP+ Wireless MESH protocol
- MME wireless routing protocol

RouterOS also features the NStreme proprietary wireless protocol that allows to extend the connection range and speed, when using MikroTik routers at each end. This has helped to achieve the current non-amplified wifi link lenght world record in Italy. Also supported is NSteme dual which allows to use two antennas at each end, one for receiving and one for sending.

# <image>

### Hotspot

The MikroTik HotSpot Gateway enables providing of public network access for clients using wireless or wired network connections. The user will be presented a login screen when first opening their web broswer. Once a login and password is provided, the user will be allowed internet access.

This is ideal for hotel, school, airport, internet cafe or any other public place where administration doesn't have control over the user computer. No software installatin or network configuration is needed, hotspot will direct any connection request to the login form.

Extensive user management is possible by making different user profiles, each of which can allow certain uptime, upload and download speed limitation, transfer amount limitation and more.

Hotspot also supports authentication against standard RADIUS servers and MikroTik's own User Manager which will give you a centralized management of all users in your networks.

- Plug-n-Play access to the Network
- Authentication of local Network Clients
- User Accounting
- RADIUS support for Authentication and Accounting
- Configurable bypass for non-interactive devices
- Walled garden for browsing exceptions
- Trial user and Advertisement modes

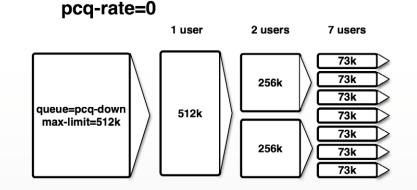
### Quality of Service

Bandwidth Control is a set of mechanisms that control data rate allocation, delay variability, timely delivery, and delivery reliability.

Quality of Service (QoS) means that the router can prioritize and shape network traffic. Some features of MikroTik RouterOS traffic control mechanism are listed below:

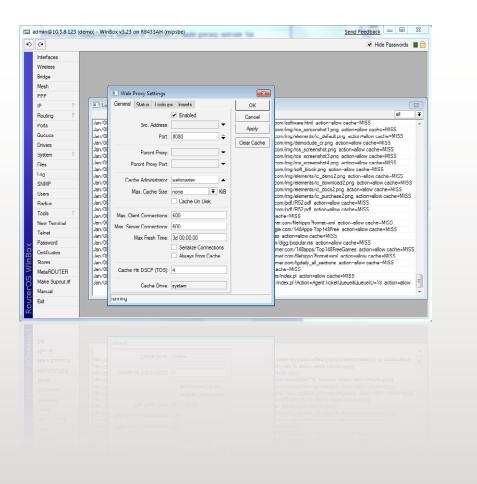
- limit data rate for certain IP adresses, subnets, protocols, ports, and other parameters
- limit peer-to-peer traffic
- prioritize some packet flows over others
- use queue bursts for faster web browsing
- apply queues on fixed time intervals
- share available traffic among users equally, or depending on the load of the channel

RouterOS supports Hierarchical Token Bucket (HTB) QoS system with CIR, MIR, burst and priority support, and provides both advanced queuing, and also an easy solution for basic QoS implementation - Simple queues.



(*		Hide Passwords
Interfaces		
Wireless		
Dridge	E Queue List	83
Mesh	Simple Queues Interface Queues Queue Tree Queue Types	
PPP	🕂 🗕 🖌 🗱 🖾 🦉 00 Reset Counters 00 Reset Al Counters	Find
P T	# Name Target Ad Rx Max Limit Tx Max Limit Packet	-
Routing ト	0	
Ports		
Queues	Simple Queue <queue1></queue1>	×
Drivers	General Advanced Statietice Traffic Total Total Statietice	OK
System 🗈		
Files	Target Upload Target Download	Cancel
Log	Rate: 0.5 kbps 30.0 kbps	Apply
SNMP	Packet Rate: 13 p/e 11 p/e	Disable
Users		
Radius		Comment
Tools P		Сору
New Terminal	Pic: 8.5 kbps	Remove
Telnet	Tx: 38.8 kbpe	Reset Counters
Password		Reset All Counters
Certificates		
Stores		Torch
MetaROUTER		
Make Supout.rif	2 items (1 selected) 0 B queued Rx Packets: 13 p/s	
Manual	IX Packets: 11 p/s. houtnonfol 11 Utdubnihdulan 11 Utdubnihdulan	
Exit	deabled	

### Web Proxy



RouterOS features a MikroTik custom made proxy server for caching web resources, and speeding up customer browsing by delivering them cached file copies at local network speed. MikroTik RouterOS implements the following proxy server features:

- Regular HTTP proxy
- Transparent proxy
- Access list by source, destination, URL and requested method (HTTP firewall)
- Cache access list to specify which objects to cache, and which not.
- Direct Access List to specify which resources should be accessed directly, and which - through another proxy server
- Logging facility
- SOCKS proxy support
- Parent proxy support
- Cache storage on external drives

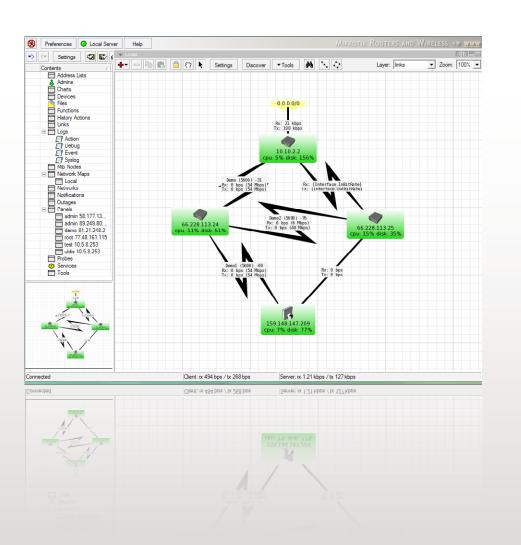
RouterOS can also act as a Transparent Caching server, with no configuration required in the customer PC. RouterOS will take all HTTP requests and redirect them to the local proxy service. This process will be entirely transparent to the user, and the only difference to them will be the increased browsing speed.

### Tools

User manager: Users										
Edit View Histor										0
AikroTik		1 Edit Ger	nerate							
Akrotik Liser Manager		3 page 1 of 3								9
		<b>∇</b> Username	<b>∇</b> IP address	∇ Caller ID	<b>∇</b> Shared users		∇ Upload Used	♥ Uptime Used		<b>∇</b> Commen
Routers	13.)	u01	0.0.0.0		Unlimited	0 B	0 B	0s	0.0.0.0	nepareiza pa
Users	E1)	02	0.0.0.0		Unlimited	0.8	08	0s	0.0.0.0	requestă ir p
Sessions										paroles nav
Customers			0.0.0				08	0s	0.0.0	nepareizs ca
Logs	10		0.0.0.0		Unlimited	0.8	0.8	0s	0.0.0.0	disabled user
			0.0.0.0				×	0s	0.0.0.0	inactive user
Profiles	121		0.0.0.0				_	0s	0.0.0.0	unlimited use
Settings	10			Main	name: u06			05	1.2.3.4	useris ar spe
0 A sessions		u08	0.0.0.0					0s	0.0.0.0	shared-user-
1 A users	-	1000			aword.					useris ar limit
	8	u09	0.0.0.0	Dist	abled: 🛄 wner: admin			0s	0.0.0.0	time/traffic li (ip pool, grou
Advanced search	E)	10	0.0.0.0	Private informat	lion		-	0s	0.0.0.0	download lim
Maintenance	i i		0.0.0.0	Firstr	name: John			0s	0.0.0.0	upload limiter
Logout	10		0.0.0.0		name: Doe			0s	0.0.0.0	transfer limite
Inglish Def 👻			0.0.0.0		hone: +371-2-73399	22	-	0s 0s	0.0.0.0	uptime limité
angeometric et	12						-			download+up
	83.	u14	0.0.0.0		ation: Pernavas 46			Os	0.0.00	useris (6GB/7
			0.0.0.0		ment No limits use					download+up
					Email: no-reply@m	krotik.com			0.0.0.0	limitēts useri
	12	u16		Constraints					0.0.00	rate limitēts
	E)	u17	0.0.0		tress: 10.5.18.243				0.0.0.0	rate limitēts
		u18	0.0.00		ler ID:			Os	0.0.00	rate limitēts
	0	u19	0.0.0.0	Shared u	users: 2	•		Os	0.0.0.0	rate limitēts
	13.	u20	0.0.0.0	<ul> <li>Statistics</li> </ul>	Used: 0 B		-	0s	0.0.0.0	v
				Lasius	ed IP: 0.0.0.0	Sare				
				Lastus	#3P2 0.0.0	Save				
	4			L431 U5	#31P: 0.0.00	Sere				
Done Dous				L491 03	#3P 0000	Sare				
Done Doue	•			L491 09		Save				3
Done  Doue				L33105		Save				
Done Dous	•			Canada Canad	410, 2020	<u>Bret</u>				• • •
Done	•		0000	ratin nteus Decessor Participa	448: 0000 nec pr 144: 0000 nec pr 144: 00			01		
Done Dous	•			Lastra Defanis Lastra L	40%: 0.000 beer 0.0 beer 0.0 b			[0] [0]		
Done Doue	•			in Binner an De Constantino Usante Lastrue	448: 0000 nec pr 144: 0000 nec pr 144: 00					

To help administrating your network, RouterOS also provides a large number of small network tools to optimize your everyday tasks. Here are some of them:

- Ping, traceroute
- Bandwidth test, ping flood
- Packet sniffer, torch
- Telnet, SSH
- E-mail and SMS send tools
- Automated script execution tools
- CALEA data mirroring
- File Fetch tool
- Active connection table
- NTP Client and Server
- TFTP server
- Dynamic DNS updater
- VRRP redundancy support
- SNMP for providing graphs and stats
- RADIUS client and server (User Manager)



### The Dude

The Dude network monitor is an application by MikroTik which can dramatically improve the way you manage your network environment. It will automatically scan all devices within specified subnets, draw and layout a map of your networks, monitor services of your devices and alert you in case some service has problems.

Not only can you monitor your RouterOS devices, you can monitor <u>any</u> device that is accessible by Ping or provides SNMP information.

You are able to make traffic and availibility graphs, outage reports, and even use the Dude as a Syslog server for your RouterOS device log files.

The Dude can also manage your RouterOS device configurations, and automate their software upgrades and mass configure them.

Best of all - The Dude is free of charge.

Level number	0 (FREE)	1 (DEMO)	3 (WISP CPE)	4 (WISP)	5 (WISP)	6 (Controller)
Upgradable To	-	no upgrades	ROS v4.x	ROS v4.x	ROS v5.x	ROS v5.x
Initial Config Support	-	-	-	15 days	30 days	30 days
Wireless AP	24h limit	-	-	yes	yes	yes
Wireless Client, Bridge	24h limit	-	yes	yes	yes	yes
RIP, OSPF, BGP						
protocols	24h limit	-	yes	yes	yes	yes
EoIP tunnels	24h limit	1	1	unlimited	unlimited	unlimited
PPPoE tunnels	24h limit	1	1	200	500	unlimited
PPTP tunnels	24h limit	1	1	200	unlimited	unlimited
L2TP tunnels	24h limit	1	1	200	unlimited	unlimited
OVPN tunnels	24h limit	1	1	200	unlimited	unlimited
VLAN interfaces	24h limit	1	1	unlimited	unlimited	unlimited
P2P firewall rules	24h limit	1	1	unlimited	unlimited	unlimited
NAT rules	24h limit	1	unlimited	unlimited	unlimited	unlimited
HotSpot active users	24h limit	1	1	200	500	unlimited
RADIUS client	24h limit	-	yes	yes	yes	yes
Queues	24h limit	1	unlimited	unlimited	unlimited	unlimited
Web proxy	24h limit	-	yes	yes	yes	yes
User manager active				-	-	
sessions	24h limit	1	10	20	50	Unlimited

### Licenses

After installing the free trial version of RouterOS on a PC, you will certainly want to keep using it. To do this, you need to purchase a license key. There are four types of RouterOS license keys available, indicated by a "level number". The lowest level is 3, which has wireless client functionality and limited number of active users, and the highest is level 6 which doesn't have any limitations, as you can see in the table on left.

It's important to note that regardless of license level chosen, all RouterOS installations allow you to use unlimited number of interfaces, include limited technical support over email and never stop working. In fact, the RouterOS license allows you to install any upgrades that MikroTik might release, up until the last upgrade of the next major release since you purchased your key. If you want, you can keep using RouterOS on that final release - RouterOS license never expires.

It's also important to note that each license is bound to the drive it's installed on, which means that each Router needs a separate license key.

All RouterBOARD devices made by MikroTik are already preinstalled with a licensed RouterOS version and don't require a new key.



To obtain MikroTik hardware and software, visit our distributors. For more information and latest news go to www.mikrotik.com