The evolution of the wireless package (6.40-6.42)

By Lorenzo Busatti





Lorenzo Busatti

- Founder of Grifonline S.r.l. [ISP] 1997
- A user of MikroTik since 2006
- Founder of Linkwave [WISP] 2006
- MikroTik Trainer 2010

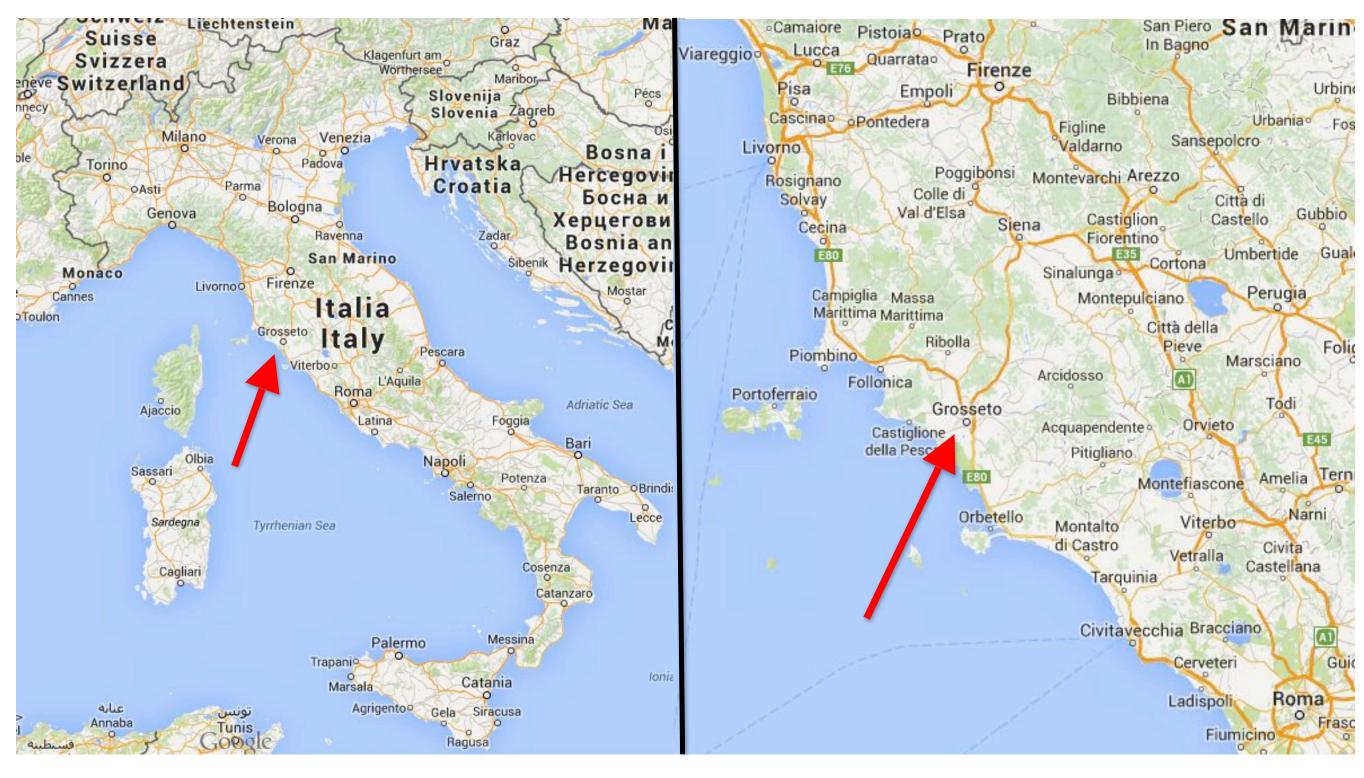
TING & W

• Member of RIPE, AMS-IX, MIX-IT















I'm a MikroTik enthusiast



I'm a MikroTik enthusiast

I'm a MikroTik evangelist



• Founder (2016) of the



Non Profit Organization for High Quality Training Partners



Dedicated to Max



The new wireless package

The new wireless package (since vers. 6.37), in RouterOS brought these features:

- The DFS "settings"
- Background scan
- Wireless Scan features (on files, etc.)
- Station Roaming
- Repeater function
- New Wireless Interfaces

The new wireless package

My MUM presentation in Milan (2017) about the v 6.37 features :

PDF: https://goo.gl/2TFtf8 Youtube: https://youtu.be/1MsbivitzEw

EUROPE ON MARCH 30 - 31, 2017



mum

The new wireless package

and don't miss this amazing presentation about "The mAP and mAP lite" as a Wireless Swiss Knife

PDF: https://goo.gl/gHw9MB
Youtube: https://youtu.be/VeZetH9uX_Y

UNITED STATES ON APRIL 28 - 29, 2016



The evolution of the wireless package

- The new wireless features from
- v 6.40:
- nv2-downlink-ratio
- NV2 APs synch
- and much more. .



- A new feature available since RouterOS 6.40
- Will allow you to setup the download/upload ratio from the AP to the stations.
- Can be setup in two ways:
 - -Dynamic-downlink
 - -Fixed-downlink



Interface <wlan:< th=""><th>2></th><th></th><th></th><th></th><th></th><th></th></wlan:<>	2>									
Nstreme NV2	Tx Power	Current Tx Power	Status	Traffic						
TDMA Period Si	ze: auto					Ŧ				
Cell Radi	us: 30	30								
	🗹 Sec	Security								
Preshared Ke	ey: Nv2-u	Nv2-usuario								
Mod	de: dynan	dynamic downlink								
🔶 Downlink Rat	io: 50	50								
Sync Secr	et:									
Queue Cou	nt: 2									
QoS: default										

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- This new feature will allow you to give "more [*transmission*] time" for the download (or upload) of the stations
- Giving your customer more download (or upload) bandwidth



- •The default value is 50
- •The minimum value is 20
- •The maximum is 80



nv2-uplink-ratio

• The Uplink ratio is automatically calculated from the downlink-ratio value.

For example:

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- With downlink-ratio=70 -> Uplink = 30
- With downlink-ratio=60 -> Uplink = 40



nv2-mode=fixed-downlink

- This new feature will allow you to **statically** schedule "more time" for the download of the stations.
- Setting up a value of 70 the AP will schedule:
 - -70% of the time for the download of the clients
 - -30% of the time for the upload of the clients



nv2-mode=fixed-downlink

Interiace <wlan2></wlan2>
Nstreme NV2 Tx Power Current Tx Power Status Traffic
TDMA Period Size: auto
Cell Radius: 30 km
Security
Preshared Key: Nv2-usuario
 Mode: fixed downlink
Downlink Ratio: 70 %
Sync Secret:
Queue Count: 2
QoS: default ₹

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nv2-mode=dynamic-downlink

- This feature will allow you to let the AP **dynamically** assign the time slots for the stations.
- BUT: when link get fully saturated it will use the Nv2-downlink-ratio that you specified (the default is 50)



nv2-mode=dynamic-downlink

	Interface <wlan2></wlan2>							
	Nstreme NV2 Tx	Power Current Tx Power Status Traffic						
	TDMA Period Size:	auto	₹					
	Cell Radius:	30						
		Security						
	Preshared Key:	Nv2-usuario						
	Meder	dynamic downlink	Ŧ					
	Mode:							
	Downlink Ratio:	50	%					
	Sync Secret:							
	Queue Count:	2						
	QoS:	default	Ŧ					
I								

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Real life bandwidth

Delivering bandwidth to one station is simple, to more stations is difficult, because of:

- Different distances of the stations
- Different setup and/or datarates
- Interference
- The time that the AP "loses" for managing time slots for the stations
- And so on

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Real life test

We experimented different scenario using different settings, to show you how you can manage more bandwidth, specially in PtMP environment.



Lab1: dynamic-downlink 50

- 1 concurrent station
- 2 HT chains
- N protocol Ce

Total bandwidth from the AP: 127 Mbps



Lab2: dynamic-downlink 50

- 9 concurrent stations
- 2 HT chains
- N protocol Ce

Total bandwidth from the AP: 80 Mbps



Lab3: fixed-downlink 70

- 9 concurrent stations
- 2 HT chains

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N protocol Ce

Total bandwidth from the AP: 106 Mbps



Lab3: fixed-downlink 70

admin@192.168.33.4 (MikroTik) - WinBox v6.40.5 on RB3011UiAS (arm)

Session: 192,168,33,4 CPU: 5% 0 Safe Mode http://www.com I CAPSMAN direction: transmit + Move up one level + tx-size: 1500 Use command at the base le Move up to base level /command 🛲 Interfaces vel Move up one level T Wireless [admin@MikroTik] > tool bandwidth-test protocol=udp user [admin@MikroTik] > tool bandwidth-test pro Use command at the base level /command admin password="" direction=transmit address=192.168.33 tocol=udp user=admin password="" direction [admin@MikroTik] > tool bandwidth-test protocol=udp user=admin 🚟 Bridge .11 transmit address=192.168.33.12 password="" direction=transmit address=192.168.33.13 E PPP status: running status: running status: running duration: 14m29s duration: 14m duration: 13m57s 🐨 Switch tx-current: 8.9Mbps tx-current: 8.4Mbps tx-current: 9.1Mbps 📽 Mesh tx-10-second-average: 9.3Mbps -10-second-average: 9.1Mbns tx-10-second-average: 9.1Mbns 255 IP Interface List 22 MPLS Interface Interface List Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE 📈 Routing **+**+ -T Find 💮 System FP Tx Packet (p/s) FP Rx Packet (p, 🔻 Name Actual MTU L2 MTU Tx FP RX ∠ Type Rx. Tx Packet (p/s) Rx Packet (p/s) FP Tx 📖 Queues bonding1 106.3 Mbps 24.3 kbps 23.8 kbps Bondina 1500 1598 8 785 33 0 bps 0 53.1 Mbps ether1 Ethernet 53.9 Mbps 4 465 RS. 1500 1598 11.8 kbps 4 3 9 2 16 13.4 kbps Files RS ether2 Ethernet 53.2 Mbps 12.4 kbps 4 393 17 53.9 Mbps 12.0 kbps 4 465 1500 1598 Log ether3 Ethernet 1500 1598 0 bps 0 bps 0 0 bps 0 0 0 bps ether4 Ethernet 1500 1598 0 bps 0 bos 0 0 bps 0 0 0 bos 🕵 Radius ether5 Ethernet 1500 1598 0 bps 0 0 bps 0 bos Ω 0 bps 0 💥 Tools ether6 Ethernet 0 1500 1598 0 bps 0 0 0 bps 0 bps 0 bps ether7 Ethernet 1500 1598 0 bps 0 0 0 bps Π 0 bps 0 bps 📰 New Terminal a Albar Ethornat 1500 1000 0 hos 0 here 0 her LCD 12 items 🦺 Partition tx-total-average: 6.4mps tx-current: 9.3Mbps random-data: no Ante Supout.rif random-data: no tx-10-second-average: 9.2Mbns direction: transmit direction: transmit 🚱 Manual tx-size: 1500 tx-size: 1500 😒 New WinBox - [Q quit|D dump|C-z pause] + Move up to base level 📃 Exit Move up one level Move up one level + /command /command Use command at the base level Use command at the base level [admin@MikroTik] > tool bandwidth-test protocol=udp user= [admin@MikroTik] > tool bandwidth-test protocol=udp use + status: can not connect admin password="" direction=transmit address=192.168.33.1 r=admin password="" direction=transmit address=192.168. duration: Os RouterOS WinBox 33.17tx-current: Obps status: running tx-10-second-average: Obps status: running duration: 13m28s duration: 13m37s tx-total-average: Obps tx-current: 9.1Mbps random-data: no tx-current: 9.3Mbps tx-10-second-average: 9.3Mbps tx-10-second-average: 9.2Mbps direction: transmit tx-total-average: 6.5Mbps tx-total-average: 6.4Mbps tx-size: 1500 random-data: no random-data: no direction: transmit direction: transmit [admin@MikroTik] > tool bandwidth-test protocol =udp user=admin password="" direction=transmit tx-size: 1500 tx-size: 1500 address=192.168.33.18 - [Q quit|D dump|C-z pause] [Q quit|D dump|C-z pause]

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ession Settings Dashboard

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Session 5

Lab4: fixed-downlink 80

- 9 concurrent stations
- 2 HT chains
- N protocol Ce

Total bandwidth from the AP: 125 Mbps



Lab4: fixed-downlink 80

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admin@192.168.33.4 (MikroTik) - WinBox v6.40.5 on RB3011UiAS (arm)

Settings Dashboard

Safe Mode

Session: 192.168.33.4

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🄏 Quick Set	Terminal				× Terminal			🗆 🗙 Termir	hal								
I CAPSMAN	din	rection: transmit			•	Move up one le		•	No. 10								
Interfaces	1	tx-size: 1500			/command	Use command at				Move up t	o base level						
٢ Wireless				vel Move up one level													
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Bridge	.11					=admin password=					andwidth-test prov nsmit address=192		admin				
🚅 PPP	status: running			=transmit address=192.168.33.12 status: running				password="" direction=transmit address=192.168.33.13 status: running									
🕎 Switch	1877 B	aration: 18m15s			duration: 17m44s				duration: 17m4ls								
°t8 Mesh		current: 11.4Mbps average: 11.3Mbps			tx-current: 10.6Mbps				tx-current: 11.3Mbps								
IP D	Interface List	iverage. 11.5mbp3			tx-10-second	l-average: 11.2Mr	ns	fx-	-10-second	1-average: 1	L.3Mbns						
Z ™ Ø MPLS ►						- i								1 [
		List Ethernet EoIP Tunne	el IP Tunnel Gl	RE TUNNEL VLAM	N VRRP Bonding LTE												
Routing	+ ▼ -												Find				
😳 System 🗈	Name	⊿ Туре	Actual MTU L	2 MTU Tx	Rx	Tx Pa	:ket (p/s) 🛛 🖡	Rx Packet (p/s)	FP Tx		FP Rx	FP Tx Packet (p/s)	FP Rx Packet (j	p, 🔻			
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📄 Files	RS 4 ether1	Ethernet	1500	1598	62.7 Mbps	17.5 kbps	5 182		22	61.2 Mbps	18.0 kbps	5 067		-			
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🧟 Radius	<pre>*/*ether3</pre>	Ethernet	1500	1598	0 bps	0 bps	0		0	0 bps	0 bps	0		-			
	ether5	Ethernet	1500	1598	0 bps	0 bps	0		0	0 bps	0 bps	0					
🔀 Tools 🔹 🗅	ether6	Ethernet	1500	1598	0 bps	0 bps	0		0	0 bps	0 bps	0					
📰 New Terminal	♦ ether7	Ethernet	1500	1598	0 bps	0 bps	0		0	0 bps	0 bps	0		•			
📮 LCD	•												•	•			
🧶 Partition	12 items																
🗋 Make Supout.rif		average: o.9mps om-data: no			random-data: no				tx-current: 10.6Mbps								
🕜 Manual		rection: transmit			direction: transmit				tx-10-second-average: 11.1Mbns Terminal IX								
		tx-size: 1500				tx-size: 1500			Terminal								
Sew WinBox	Terminal				- [Q quit D dum	mp[C-z pause]		+	1	Move	up to base level		-				
🛃 Exit	Move up one level								í		up one level						
	/command Use command at the base level [admin@MikroTik] > tool bandwidth-test protocol=udp use					Terminal					Command Use command at the base level						
						status: can not connect											
	r=admin password="" direction=transmit address=192.168.																
<	33.17 status: running				tx-current: Obps tx-10-second-average: Obps				status: running								
2	duration: 17m21s				tx-total		duration: 17m14s										
	tx-current: 10.9Mbps				ran		tx-current: 11.5Mbps										
N N	tx-10-second-	average: 11.2Mbps	d	tx-10-second-average: 11.3Mbps													
		average: 6.9Mbps	tx-size: 1500				tx-total-average: 6.9Mbps										
ő	random-data: no				random-data: no												
ō	direction: transmit				[admin@MikroTik] > tool bandwidth-test protocol direction: transmit =udp user=admin password="" direction=transmit tx-size: 1500												
	tx-size: 1500 [Q quit D dump C-z pause]				address=192.168.33.18												
Kouteros								+					•				
<u>r</u>																	

Labs results

- 1 station, ratio d 50 -> 127 Mbps
- 9 stations, ratio d 50 -> 80 Mbps
- 9 stations, ratio f 70 -> 106 Mbps
- 9 stations, ratio f 80 -> 125 Mbps



[experimental support]



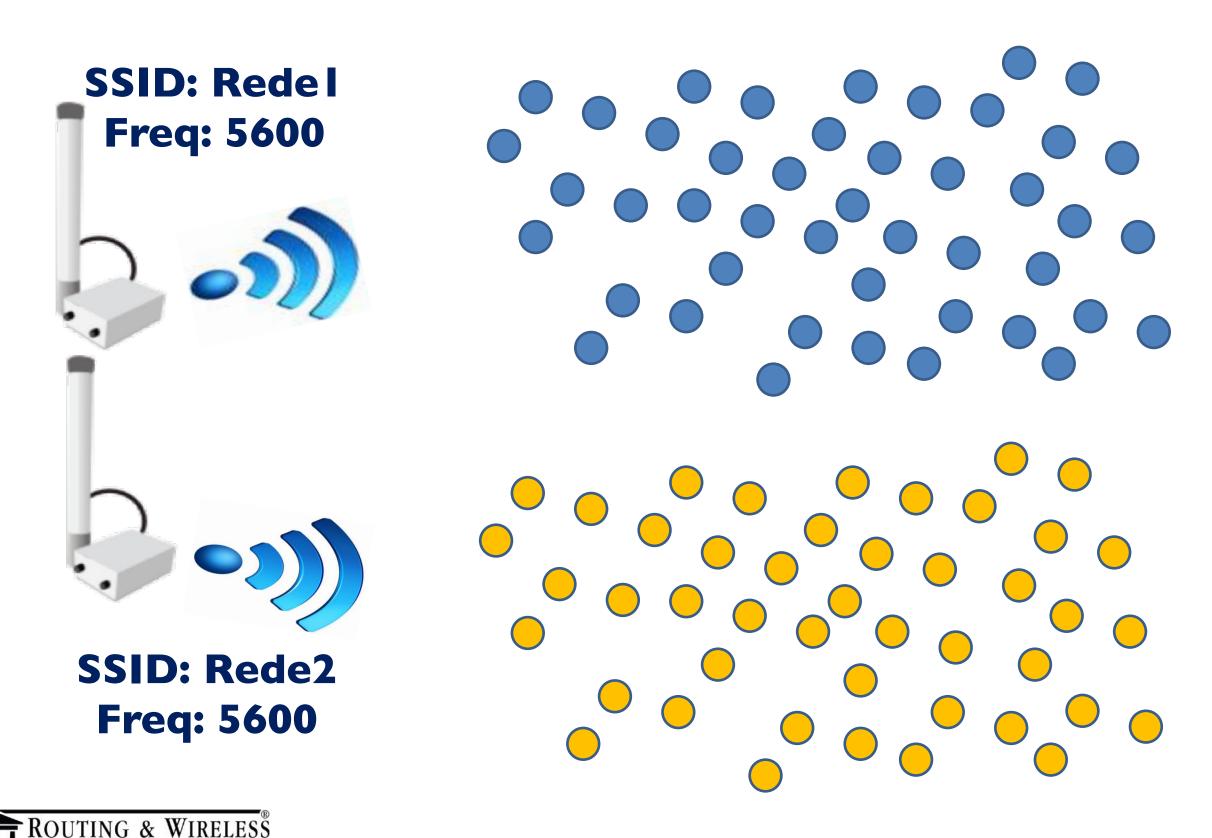
- Introduced with RouterOS 6.40
- This feature will allow multiple MikroTik Nv2 APs at the same location to coexist in a better fashion by reducing the interference between each other.
- One of the most desired wireless implementations in RouterOS

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Different from other vendors (no GPS)

- This feature will synchronize the transmit/ receive "time windows" of APs on the same frequency, so that all "synced MikroTik Nv2 Aps" transmit/receive at the same time.
- That allows to reuse the same wireless frequency on the location for multiple APs, giving more flexibility in frequency planning.





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In the scenario there is:

• ONE "master" APs

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• MULTIPLE "slaves" APs

- All of them must use the SAME frequency
- They can have **different** SSIDs
- The can use different Nv2 encryption password

But all of them must use the SAME nv2-syncsecret.

They will synchronize using **this** "password", regardless of the SSID and the Nv2 encryption password.



	Interface -	<wlan2< th=""><th>:></th><th></th><th></th><th></th><th></th><th></th></wlan2<>	:>										
	Nstreme	NV2	Tx Power	Current Tx Power	Status	Traffic							
	TDMA Per	riod Siz	e: auto	auto									
	Cel	ll Radiu	is: 30	30									
			🗹 Secu	Security									
	Presha	ired Ke	y: Nv2-us	Nv2-usuario									
		Mod	e: syncima	sync master									
		nk Rati	o: 70	70									
	Syn	c Secre	et: Nv2-sy	Nv2-sync-usuario									
	Oueu	e Cour	nt: 2	2									
		Qo		default									
TINC 9	WIRFIES®												

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	Interface -	<wlan2< th=""><th>2></th><th></th><th></th><th></th><th></th><th></th><th></th></wlan2<>	2>										
	Nstreme	NV2	Tx	Power	Current Tx Power	Status	Traffic						
	TDMA Per	riod Siz	e:	auto					Ŧ				
	Cell Radius:			30									
				Security									
	Presha	ired Ke	y:	Nv2-usuario									
		Mod	e:	sync slave									
	Downli	nk Rati	io:	50					%				
	Syn	c Secre	et:	Nv2-sync-usuario									
	Queue Count:			2									
Doutine	WIRELES®	Qo	5:	default					•				

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Slave APs will first start to search for a Master AP by matching it against specified "nv2-sync-secret".

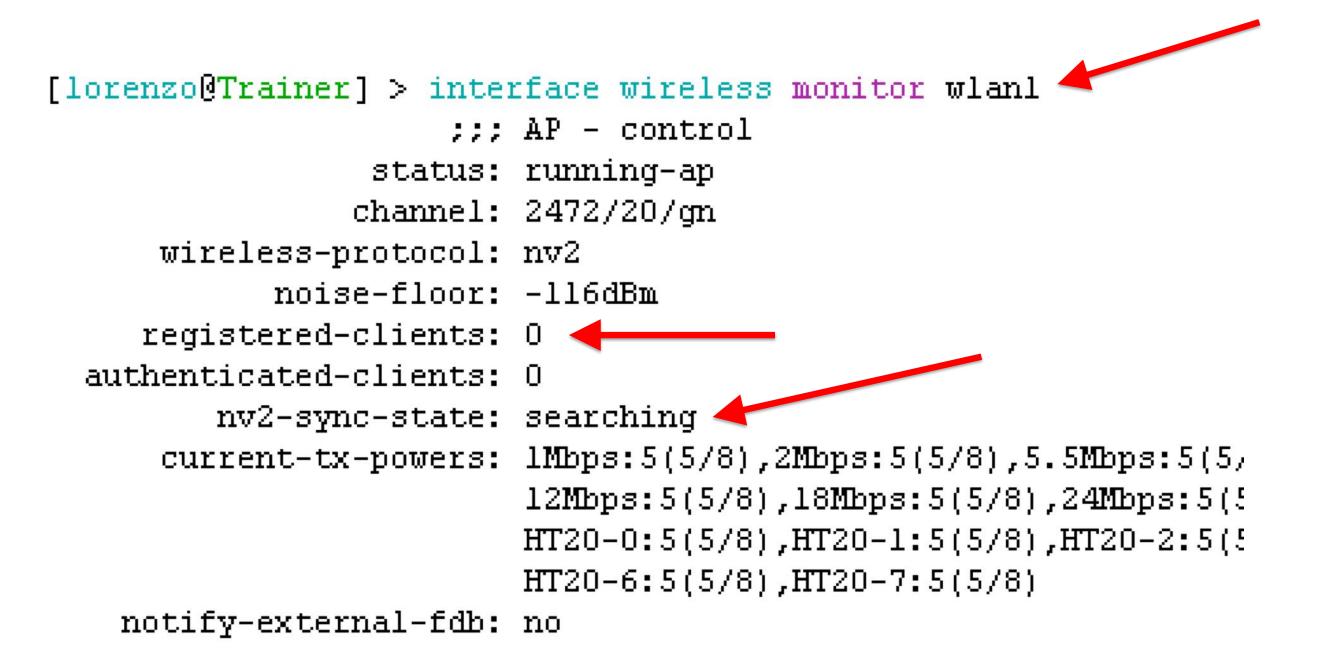
After a Master AP is found the Slave AP will calculate the **distance** to the Master AP because it is possible that the Master AP is not located in the same location.



Then the Slave AP starts to operate as AP, adapting the period size and the downlink ratio from the synced Master AP.

In addition after the Slave AP is operational other Slave APs can use this Slave AP to sync with.





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[lorenzo@Trainer] > interface wireless monitor wlan2 ;;; AP -Testset status: running-ap channel: 5600/20/ac wireless-protocol: nv2 noise-floor: -107dBm registered-clients: 4 authenticated-clients: 4 nv2-sync-state: synced nv2-sync-master: E4:8D:8C:6B:78:BF nv2-sync-distance: 1 nv2-sync-period-size: 2 nv2-sync-downlink-ratio: 50 • notify-external-fdb: no [Q quit|D dump|C-z pause]

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- Slave AP periodically listens for the Master AP and will check if the "nv2-sync-secret" still matches and adapting the parameters again.
- If the Master AP wireless interface will be disabled/enabled all the Slaves will be also disabled accordingly, then they will start the synchronization process from the beginning.
- If the Master AP will stop to work then the Slave APs will do the same as they do not have sync information.

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Please remember that this specific resource is still in the process of development.



More features?

On Tue Mar 20, 2018 12:30 pm Uldis created a topic in the MikroTik forum with the title:

Significant improvement for wireless Nv2 PtMP





MikroTik made significant improvement for wireless **Nv2 PtMP** configurations from the **6.42rc46** version release, where the clients can still use the old version.



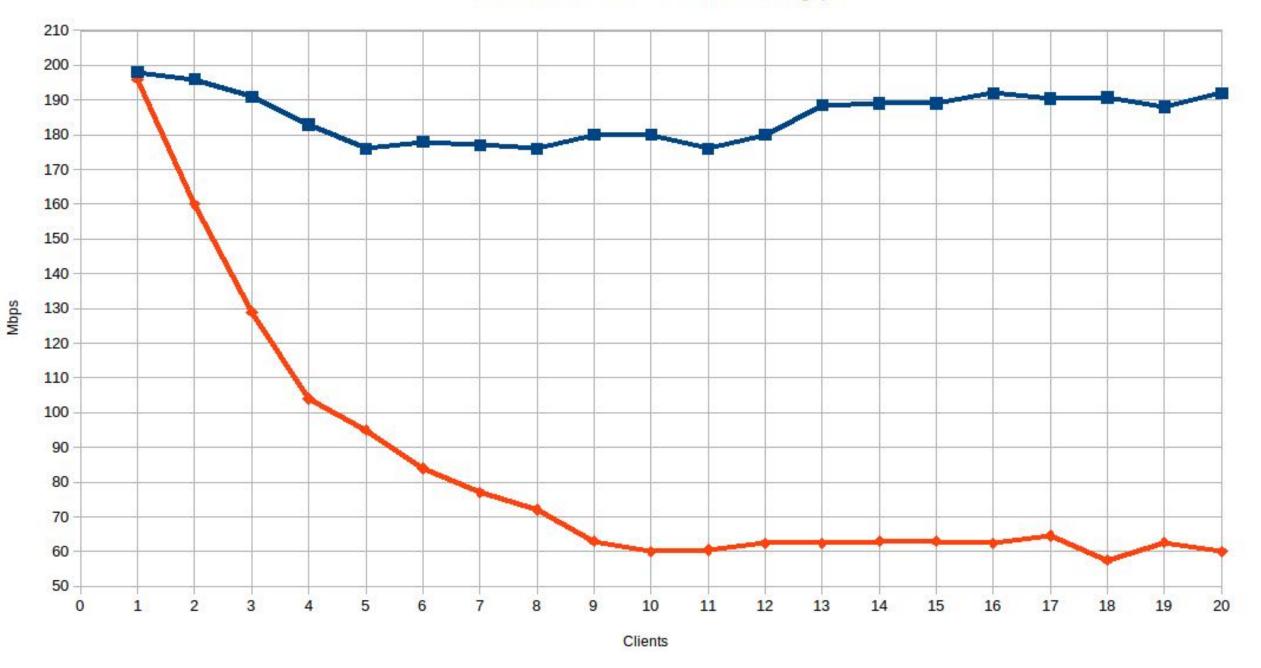
Before the improvement (MT Labs)

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NV2 with 20 Clients, Clients vs throughput

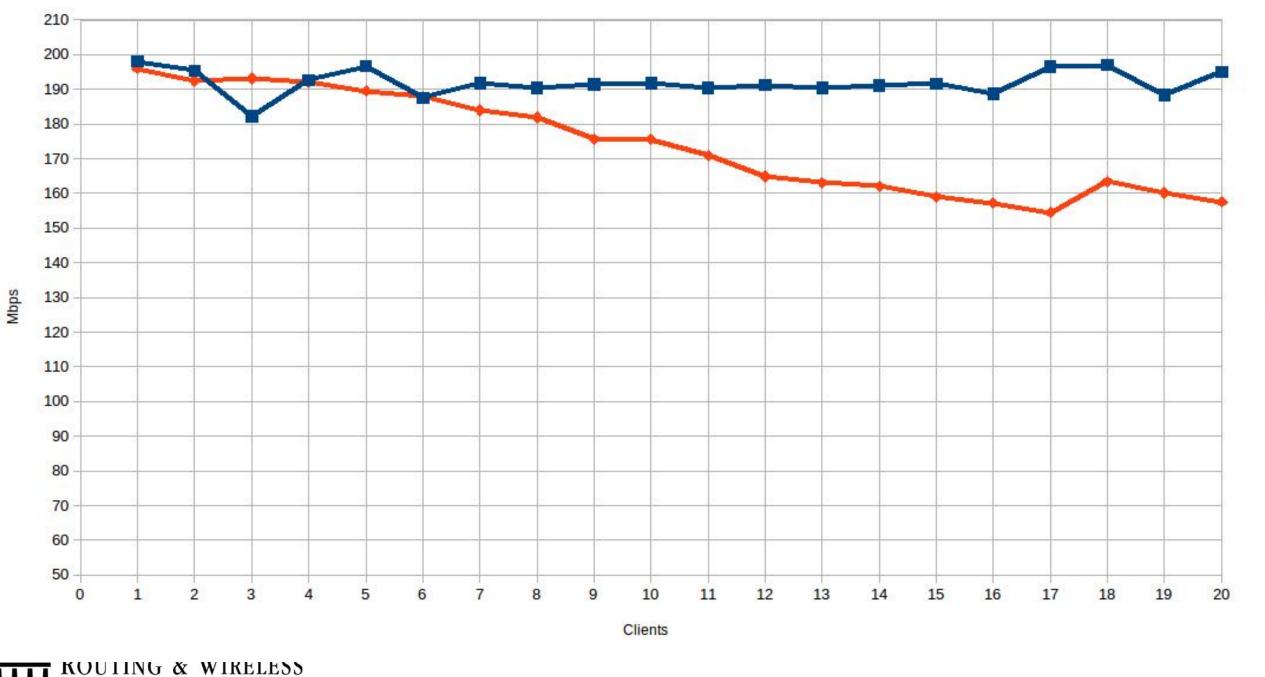


After the improvement (MT Labs)

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Improved NV2 with 20 Clients, Clients vs throughput



It is still in development, but almost everyone that tried obtained a better aggregated bandwidth from an AP to the clients:

- "only" 20 % more
- 40-50 % more
- 60-65% more



"Live" testing the 6.42rc NV2 PtMP

Tested in a real life outdoor environment, using a Netmetal with:

- 2 chain
- 20 Mhz channel
- 802.11n protocol and Nv2



"Live" testing the 6.42rc NV2 PtMP

The customers distances and devices:

WiFi Interfaces W6	60G Station Nstreme Dual	Access List	Registration	Connect List	Secu	curity Profile	:S	Channels			
- 7 00 Res	set										
Radio Name	MAC Address	Interface	Uptime	Distance (km)		AP N	W	. Last Activit	Tx/Rx Signal	. Tx Rate	Rx Rate
*	64:D1:54:4E:C1:45	wlan1	03:00:31		14 1	no	no	0.000	-63/-58	52Mbps-2	6Mbps
*	6C:3B:6B:74:23:DC	wlan1	03:00:30	A	4	no r	no	0.000	-53/-57	130Mbps	39Mbps-2
*	E4:8D:8C:FB:CE:F5	wlan1	03:00:30		4	no r	no	0.000	-54/-53	65Mbps-2	65Mbps-2
*	00:0C:42:B2:53:7A	wlan1	03:00:29		4	no r	no	0.010	-57/-57	65Mbps-2	the state of the s
*	D4:CA:6D:A1:AB:25	wlan1	03:00:28	A	4	no r	no	0.010	-78/-76	48Mbps	36Mbps
*	4C:5E:0C:84:69:ED	wlan1	03:00:27	1	4	no r	no	0.010	-74/-76	36Mbps	36Mbps
*	64:D1:54:07:9D:D1	wlan1	03:00:23		14	no r	no	0.010	-63/-66	130Mbps	78Mbps-2
*	4C:5E:0C:83:F1:BB	wlan1	03:00:16	A CONTRACTOR OF A CONTRACTOR OFTA CONTRACTOR O	3	no r	no	0.010	-55/-48	65Mbps-2	65Mbps-2
*	4C:5E:0C:8D:C4:89	wlan1	03:00:09		4	no r	no	0.010	-65/-58	19.5Mbps	58.5Mbps
*	64:D1:54:90:CF:F5	wlan1	03:00:09		3	no r	no	0.010	-63/-59	117Mbps	104Mbps
*	E4:8D:8C:F8:B1:67	wlan1	03:00:06		4	no r	no	0.010	-61/-60	54Mbps	18Mbps
*	64:D1:54:04:4D:10	wlan1	03:00:03	A. T	10 1	no	no	0.010	-58/-53	117Mbps	117Mbps



Zitems

"Live" testing the 6.40.4 NV2 PtMP

Ce Safe Mode	Session:										
Guick Set	Wireless Tables										
CAPsMAN	Interfaces Nstreme Du	al Access List Registration	Connect List	Security Pr	ofiles	Channe	els				
Interfaces			Connoor Lie	. occurry ri	onico	Charin	0.0				
Wireless	00 Reset										
	Radio Name	/ MAC Address	Interface	Uptime	AP	W	Last Activit	Tx/Rx Signal	Tx Rate /	Rx Rate	
Bridge	*	64:D1:54:04:4D:10	wlan1	00:34:10	no	no	0.000	-55/-54	130Mbps	130Mbps	
Switch	*	64:D1:54:90:CF:F5	wlan1	00:34:10	no	no	0.010	-62/-59	117Mbps	117Mbps	
	*	4C:5E:0C:84:69:ED	wlan1	00:34:10	no	no	0.000	-71/-76	36Mbps	36Mbps	
Mesh	(4)	4C:5E:0C:8D:C4:89	wlan1	00:34:10		no		-66/-57	and present and the presence of the balance interpretation of	65Mbps-2	
P P		E4:8D:8C:FB:CE:F5	wlan1	00:34:09		no		-54/-56	and a present such as the property of a first such as have	65Mbps-2	
System	*	D4:CA:6D:A1:AB:25	wlan1	00:34:07		no		-77/-78	39Mbps-2	and the second	
	*	E4:8D:8C:F8:B1:67	wlan1	00:34:10		no		-62/-60	and the second se	19.5Mbps	
Queues		00:0C:42:B2:53:7A	wlan1	00:34:09		no		-58/-58	65Mbps-2	a property of the second se	
Files		4C:5E:0C:83:F1:BB	wlan1	00:31:03		no		-55/-47	and have been also also also also also also	65Mbps-2	
		64:D1:54:07:9D:D1	wlan1	00:34:04		no		-63/-66	where the second s	117Mbps	
Log	*	64:D1:54:4E:C1:45 6C:3B:6B:74:23:DC	wlan1	00:34:08 00:34:10		no		-63/-59 -53/-57	26Mbps-2	and a second of the second	
Radius	NV III	6C.3B.6B.74.23.DC	wlan1	00.34.10	no	no	0.000	-03/-07	54Mbps	39Mbps-2	
Tools											
New Terminal	12 items										
MetaROUTER											
Partition	The second										
	Interface List										
Make Supout.rif	Interface Interface Lis	t Ethernet EoIP Tunnel IP	Tunnel GRI	E Tunnel VI	AN	VRRP	Bonding LT	TE			
Manual			11				1.	12			
New WinBox	Name	/ Type Act	tual MTU L2	MTU Tx			Rx		Tx Packet (p	/s) Rx Par	cket (p/s
, Exit										-,	

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"Live" testing the 6.41.3 NV2 PtMP

C*	Safe Mode	Session:	-								
a Q	uick Set	Wireless Tables									
î C	APsMAN	WiFi Interfaces W60	G Station Nstreme Dual	Access List	Registration	Connect Li	st Security Pr	ofiles Channe	s		
m In	terfaces				-	Connoc L	or occurry in				
N	lireless	00 Res		1				The second s			
		Radio Name	MAC Address	Interface	Uptime	AP W		Tx/Rx Signal .		Rx Rate	
BI	idge		64:D1:54:4E:C1:45	wlan1	00:17:54			-63/-59	6Mbps	6Mbps	0
S	witch		6C:3B:6B:74:23:DC	wlan1	00:17:53			-53/-57	130Mbps	and the second se	
M	esh		E4:8D:8C:FB:CE:F5	wlan1	00:17:52			-54/-55		65Mbps-2	•
		40- 40-	00:0C:42:B2:53:7A	wlan1	00:17:52		10 million (10 mil	-58/-57	65Mbps-2	and the second state of the second seco	
IP			D4:CA:6D:A1:AB:25	wlan1	00:17:50	1999		-78/-77	39Mbps-2	and the second sec	-
S	ystem 🗅	*	4C:5E:0C:84:69:ED 64:D1:54:07:9D:D1	wlan1 wlan1	00:17:50 00:17:46		and the second se	-73/-78 -65/-67	36Mbps	36Mbps 104Mbps	10
			4C:5E:0C:83:F1:BB	wlan1	00:17:39			-55/-48	and the second of the second se	19.5Mbps	
	ueues	**	4C:5E:0C:8D:C4:89	wlan1	00:17:32			-67/-58	and the second statistical part of the second states and the second states and the second states and the second states are set of the second states are second states are set of the second states are set of the second states are second states are set of the second states are second states are set of the second states are set of the second states are second states are set of the second states are	52Mbps-2	
Fi	les	**	64:D1:54:90:CF:F5	wlan1	00:17:32			-61/-59	and the second sec	117Mbps	
Lo	Da	*	E4:8D:8C:F8:B1:67	wlan1	00:17:29			-61/-61		13Mbps-2.	
			64:D1:54:04:4D:10	wlan1	00:17:25			-56/-54		130Mbps	Sar Sar
s R	adius		La la classificación de la composición		-1,						
T	ools N										
i N	ew Terminal										
		12 items									
-	etaROUTER	1									
Pa	artition	Interface List									
M	ake Supout.rif		ist Ethernet EoIP Tunn		CDF T	1		ITE			
		Interface Interface L	ist Ethemet EoIP lunn	el IP l'unnel	GRE Tunne	ei VLAN	VKKP Bondin	g LIE			
M	anual	+ * *	🗇 🍸 Detect li	nternet							
N	ew WinBox	Lance I have been	ul [[] [[]] [[]			-					
E	vit	Name	/ Туре	Actual MTU	J L2 MTU	IX	R	K	Tx Pac	cket (p/s)	Rx Packet (p/s
-	-										
		RS ��wlan1	Wireless (Atheros AR9		00 1600		22.8 Mbps	00	1 kbps	1 945	- K

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"Live" testing the 6.42rc52 NV2 PtMP

	Safe Mode	Session:												
1	Quick Set	Wireless Ta	ables											
1	CAPsMAN	WiFi Interf	aces W60G	Station Na	treme Dual	Access List	Registration	Conne	ect List	Security Pro	ofiles Channel			
-	I Interfaces			1			-							
9	Wireless		00 Reset											
		Radio Nar	ne	MAC Addr	ess	Interface	Uptime	AP	W	Last Activit	Tx/Rx Signal	. Tx Rate	Rx Rate	
ē	Bridge			00:0C:42:		wlan1	00:48:36		no		-59/-58	the second s	19.5Mbps	
	Switch	*		D4:CA:6D		wlan1	00:48:36		no		-76/-77		19.5Mbps	
0,0	Mesh	*		E4:8D:8C:		wlan1	00:48:36		no		-53/-55	and prove state in the second s	65Mbps-2	
				4C:5E:0C:		wlan1	00:48:35		no		-56/-48		65Mbps-2	1
255	IP r			4C:5E:0C: 64:D1:54:		wlan1 wlan1	00:48:34 00:48:33		no		-74/-75 -64/-60	36Mbps	36Mbps	
-	System			64:D1:54: 64:D1:54:		wian 1 wian 1	00:48:33		no		-64/-60	26Mbps-2 104Mbps		29
4				4C:5E:0C:		wlan1	00:48:18		no		-65/-59	48Mbps	65Mbps-2	
		*		64:D1:54:		wlan1	00:48:17		no		-56/-53	130Mbps	and the line of the second sec	
	Files	<		E4:8D:8C		wlan1	00:48:16		no		-62/-62	6Mbps	6Mbps	
	Log	*		6C:3B:6B:		wlan1	00:48:15		no		-53/-57	130Mbps		
	Radius	*		64:D1:54:	90:CF:F5	wlan1	00:48:12	no	no	0.010	-62/-59	and the second se	104Mbps	
×	Tools 🗅													
2.	New Terminal	-												
	MetaROUTER	12 items												
100			211											
	Partition	Interface Li	st		N.	-		710						
-	Make Supout.rif	Interface	Interface List	Ethemet	EoIP Tunne	IP Tunnel	GRE Tunn	el VLA	N VR	RP Bondine	a LTE			
2	Manual				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1000					-			
	New WinBox	+		T	Detect Int	emet								
		Nam	e 7	Туре		Actual MT	J L2 MTU	Tx		R	<<	Tx Pac	:ket (p/s)	Rx Packet (p/s)
P	Exit			105502		11	-13	10					95 X2	1 Star 32

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A D E M

Y

Wrap up

- I think that MikroTik started to put their hands on the wireless part of RouterOS in a PtMP evironment.
- I hope you enjoyed my presentation and the news in the wireless package since the version 6.40

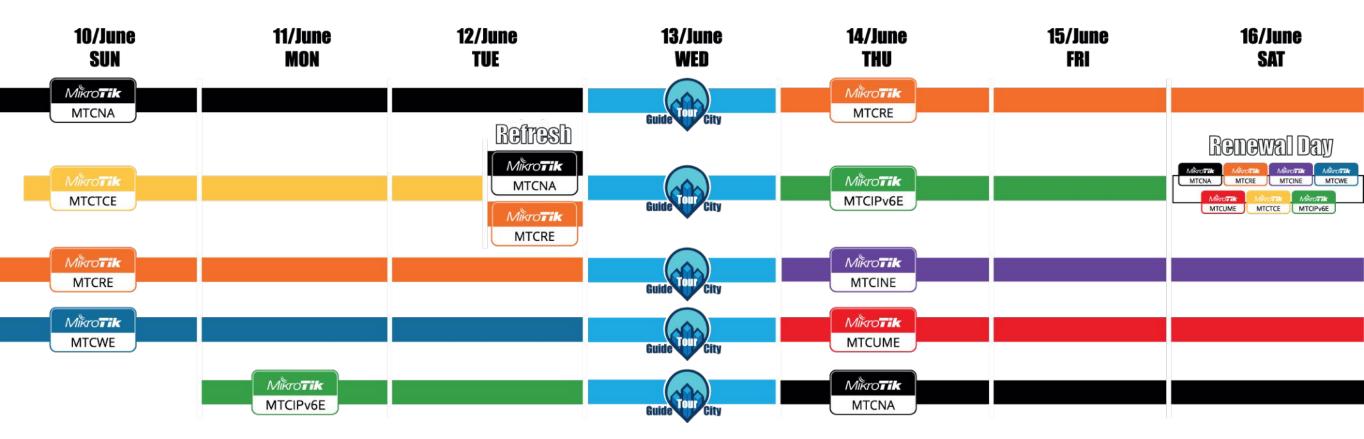


















Thank you!

Q & A

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