

MIKROTIK QUALITY OF SERVICE IN WIRELESS BRIDGE PTP LINK

By

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OUTLINES

1. Wireless Problems in Congested Environment.
2. Solution with Mikrotik ROS
3. How does it work in Mikrotik?
4. Configuration to be used
5. My Successful Project Story
6. Mikrotik ROS Configuration Steps
7. Conclusion

WIRELESS BRIDGE PTP LINK

????



Wireless point to point links are widely used as

- quick-to-deploy
- cost effective
- Less Maintenance Time
- Troubleshoot free
- More..

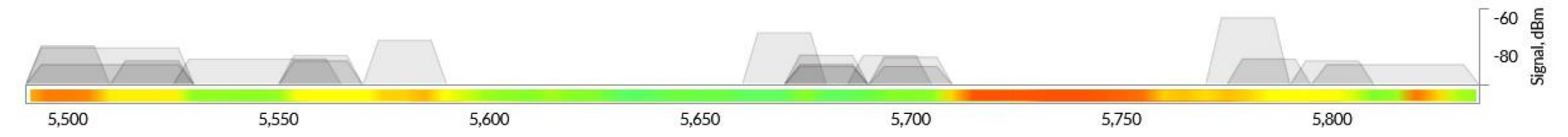


CONGESTED ENVIRONMENT



Scanned Frequencies >

Graphical View



Search

MAC ADDRESS ↑	SSID	DEVICE NAME	RADIO MODE	ENCRYPTION	SIGNAL/NOISE, dBm	FREQUENCY, GHz
00:15:6D:63:F6:EE	MTY		802.11a	NONE	-84 / -103	5.68
00:27:22:F4:73:A2	K-S-B		802.11n	NONE	-85 / -103	5.7
04:18:D6:38:E9:16	netsat.1		802.11n	NONE	-59 / -94	5.78
04:18:D6:58:82:9C	SC TW Levis2		802.11n	NONE	-81 / -96	5.785
04:18:D6:58:84:A2	AP5642		802.11n	NONE	-82 / -99	5.52
04:18:D6:A6:65:F7	Trafco		802.11n	NONE	-79 / -102	5.695
04:18:D6:E8:9A:BD	AP150		802.11n	NONE	-79 / -100	5.56
24:A4:3C:66:69:2F	AMCO Paints		802.11n	WPA	-84 / -100	5.805
24:A4:3C:6E:2F:E9	PCSIR-Sect-3		802.11n	NONE	-85 / -103	5.68
24:A4:3C:9E:66:E3	saddam1234		802.11n	NONE	-67 / -102	5.67
24:A4:3C:D6:BB:96			802.11n	NONE	-71 / -99	5.58

WIRELESS PROBLEMS IN CONGESTED ENVIRONMENT

SPEED TEST

SELECT DESTINATION IP 192.168.15.237

REMOTE WEB PORT 80

DIRECTION Duplex

DURATION 30 seconds

USER ubnt

PASSWORD

☐ REMEMBER CREDENTIALS FOR THIS SESSION

STOP

STARTED

00:30:000

PING

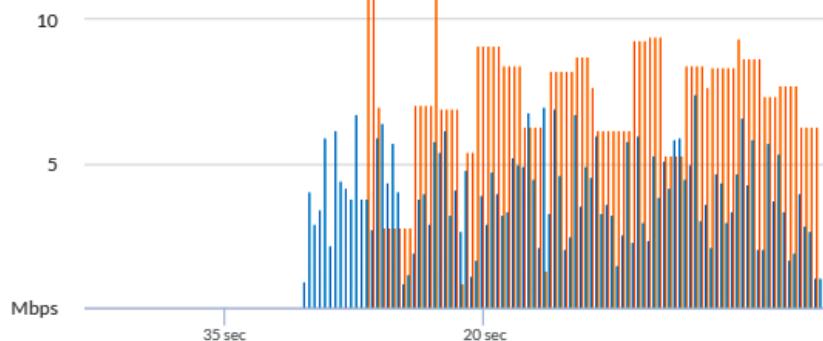
802.81 ms

TX

6.28 Mbps
avg. 6.32 Mbps

RX

1.05 Mbps
avg. 3.98 Mbps



NETWORK PING

SELECT DESTINATION IP 192.168.15.10

PACKET COUNT: 50

PACKET SIZE: 56

HOST

TIME

TTL

RESULTS

192.168.15.10

311.13

64

192.168.15.10

344

64

192.168.15.10

311.55

64

192.168.15.10

333.62

64

192.168.15.10

333.83

64

192.168.15.10

Request timeout

192.168.15.10

Request timeout

192.168.15.10

Request timeout

192.168.15.10

Request timeout

192.168.15.10

Request timeout

192.168.15.10

Request timeout

192.168.15.10

Request timeout

192.168.15.10

Request timeout

PACKET LOSS 82 %

10 OF 50 PACKETS RECEIVED

MIN 233.62 ms

AVG 802.81 ms

MAX 1446.89 ms

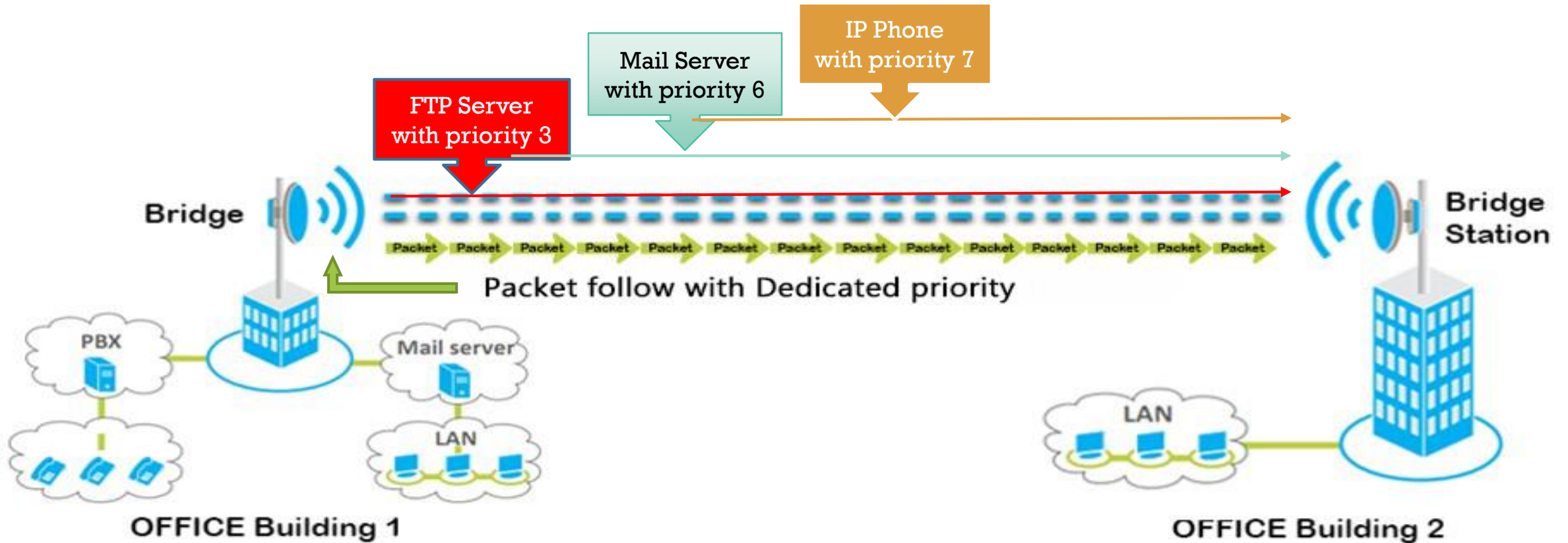
START

SOLUTION WITH MIKROTIK OS

MikroTik Router OS offer a very powerful and extremely flexible QoS in wireless environment.

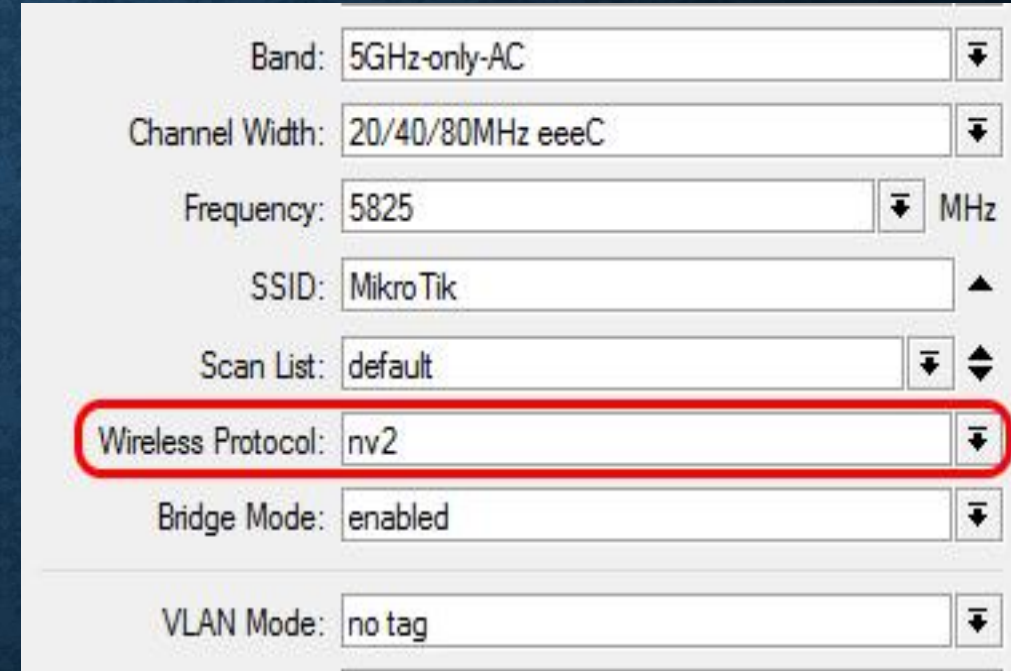
- **Nstream v2 (NV2) Protocol**
- **Queues Management**
- **Frame-Priority**

HOW DOES IT WORKS IN MIKROTIK



NV2 PROTOCOL

- **Nstream v2 (NV2) is TDMA technology (Time Division Multiple Access) based Wireless PROTOCOL**
- **You can configure Nv2 in the Wireless menu.**
- **The most important benefits of Nv2 are:**
 - **Increased speed**
 - **More client connections in Point to multi point environments**
 - **Lower latency**
 - **No distance limitations**
 - **No penalty for long distances.**

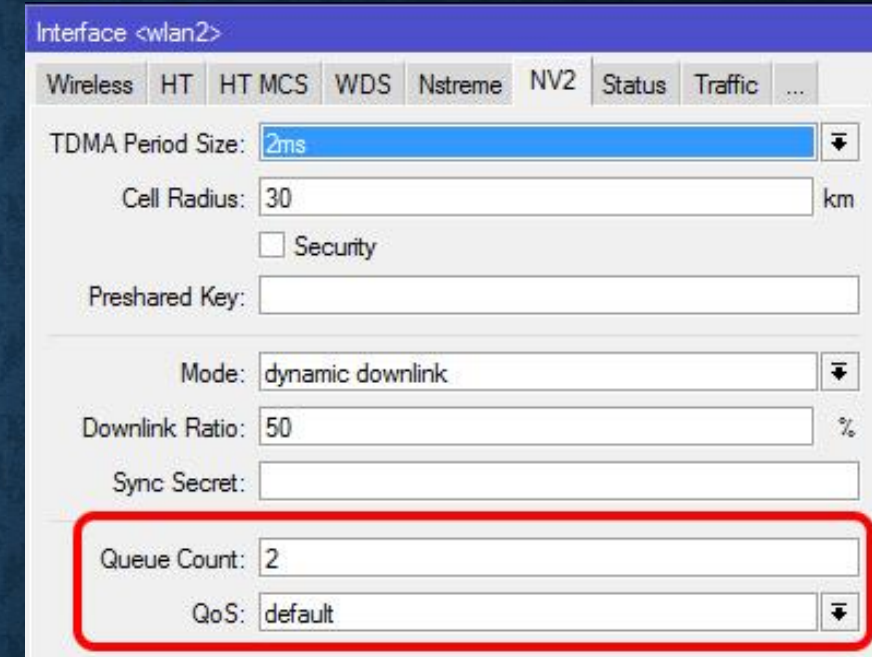


The image shows a screenshot of a MikroTik configuration interface for the Wireless menu. The 'Wireless Protocol' field is highlighted with a red rectangle and contains the value 'nv2'. Other visible settings include Band: 5GHz-only-AC, Channel Width: 20/40/80MHz eeeC, Frequency: 5825 MHz, SSID: MikroTik, Scan List: default, Bridge Mode: enabled, and VLAN Mode: no tag.

Band:	5GHz-only-AC	↓
Channel Width:	20/40/80MHz eeeC	↓
Frequency:	5825	↓ MHz
SSID:	MikroTik	▲
Scan List:	default	↓ ▲
Wireless Protocol:	nv2	↓
Bridge Mode:	enabled	↓
VLAN Mode:	no tag	↓

NV2 WITH QUEUES

- By default (*nv2-qos=default*) NV2 use two queues (*nv2-queue=2*).
- In this mode, all outgoing packets are handled by the integrated QoS algorithm based on packet type and size.



Interface <wlan2>

Wireless HT HT MCS WDS Nstreme NV2 Status Traffic ...

TDMA Period Size: 2ms

Cell Radius: 30 km

☐ Security

Preshared Key:

Mode: dynamic downlink

Downlink Ratio: 50 %

Sync Secret:

Queue Count: 2

QoS: default

QoS settings are only done on the AP!
There is no need at station end

NV2 QUEUES MANAGEMENT

- We can use 2 (RouterOS default), 4 or 8 separate queues inside a NV2 link for individual traffic classes.
- **‘Packet to queue’** depends on the selected number of available NV2 queues (2, 4 or 8 queues)

nv2-queue=2	nv2-queue=4	nv2-queue=8
priority 0,1,2,3 -> queue 0	priority 0,3 -> queue 0	priority 1 -> queue 0
priority 4,5,6,7 -> queue 1	priority 1,2 -> queue 1	priority 2 -> queue 1
	priority 4,5 -> queue 2	priority 0 -> queue 2
	priority 6,7 -> queue 3	priority 3 -> queue 3
		priority 4 -> queue 4
		priority 5 -> queue 5
		priority 6 -> queue 6
		priority 7 -> queue 7

QUEUES BEHAVIOR

To understand this behavior, we have to take a deeper look in the IEEE Standard for 802.1D-2004 Bridge definitions!

User Priority	Acronym	Traffic Type
1	BK	Background
2	./.	Spare
0 (Default)	BE	Best Effort
3	EE	Excellent Effort
4	CL	Controlled Load
5	VI	Video
6	VO	Voice
7	NC	Network Control



THE FRAME-PRIORITY OPTION

- If the built-in rules do not apply, also in this mode the queuing mechanism use the Frame-Priority field.

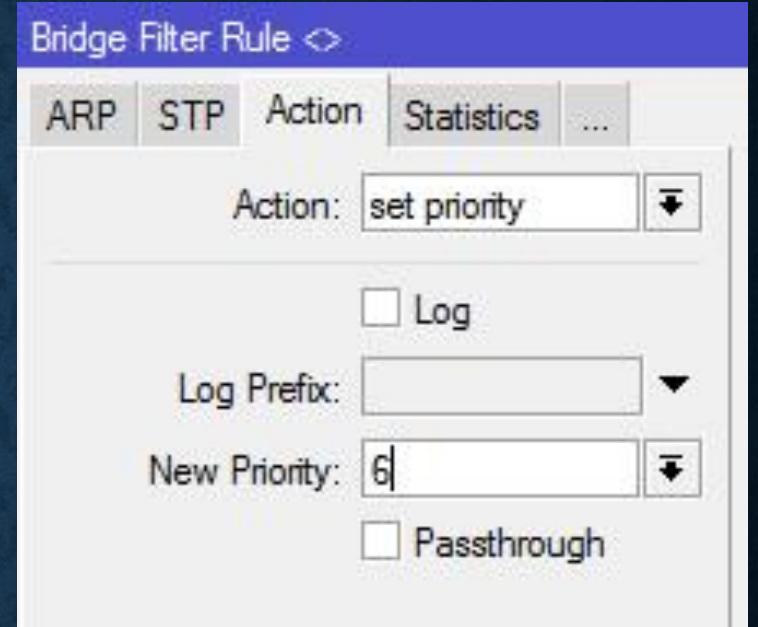


The screenshot shows the Mikrotik WinBox configuration window for Interface <wlan2>. The 'Wireless' tab is selected. The 'TDMA Period Size' is set to 2ms. The 'Cell Radius' is set to 30 km. The 'Security' checkbox is unchecked. The 'Preshared Key' field is empty. The 'Queue Count' is set to 2. The 'QoS' dropdown menu is open, showing 'frame priority' as the selected option. A red rectangle highlights the 'Queue Count' and 'QoS' fields.

Wireless	HT	HT MCS	WDS	Nstreme	NV2	Status	Traffic	...
Interface <wlan2>								
TDMA Period Size: 2ms								
Cell Radius: 30 km								
☐ Security								
Preshared Key:								
Queue Count: 2								
QoS: frame priority								

THE FRAME-PRIORITY FIELD

- This can easily be done using the 'action=set-priority' functionality inside the powerful firewall subsystem of RouterOS which is available for
 - Layer2 (in Bridge Filter)
 - Layer3 (in IP Firewall Mangle)



Bridge Filter Rule <>

ARP STP Action Statistics ...

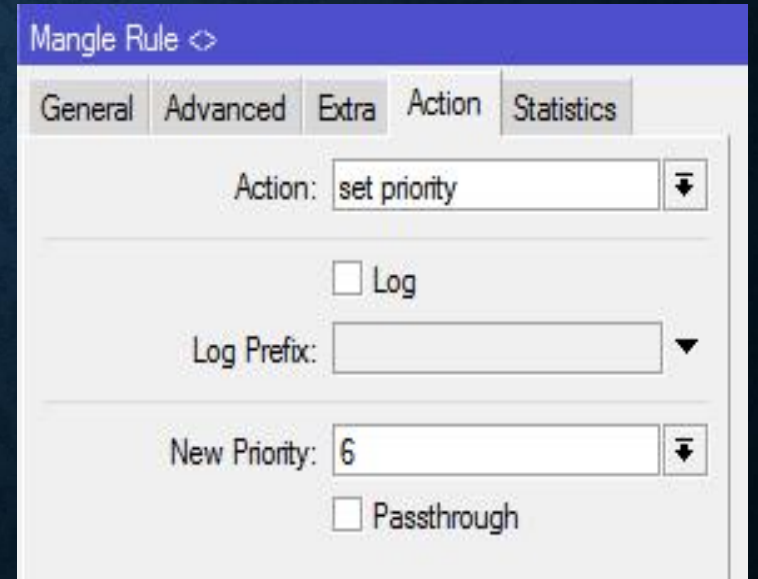
Action: set priority

☐ Log

Log Prefix:

New Priority: 6

☐ Passthrough



Mangle Rule <>

General Advanced Extra Action Statistics

Action: set priority

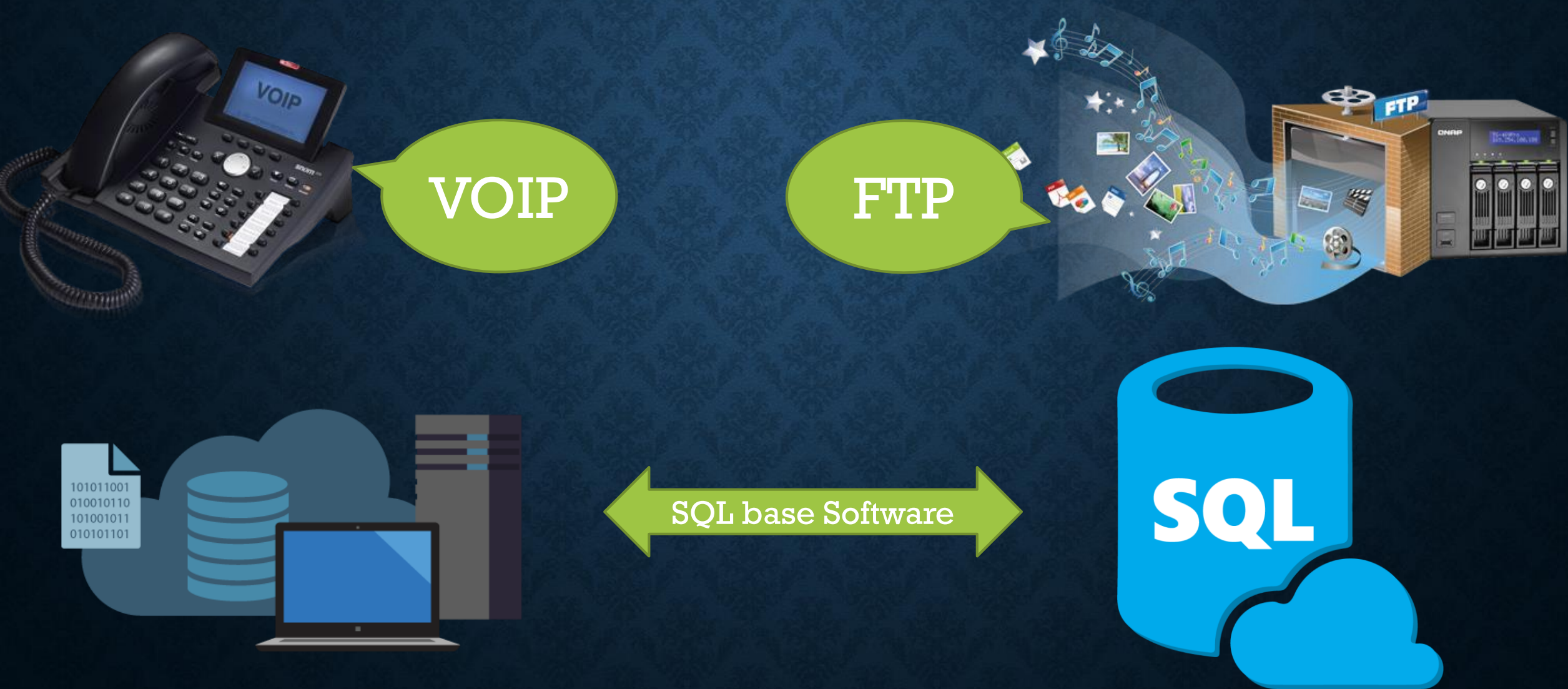
☐ Log

Log Prefix:

New Priority: 6

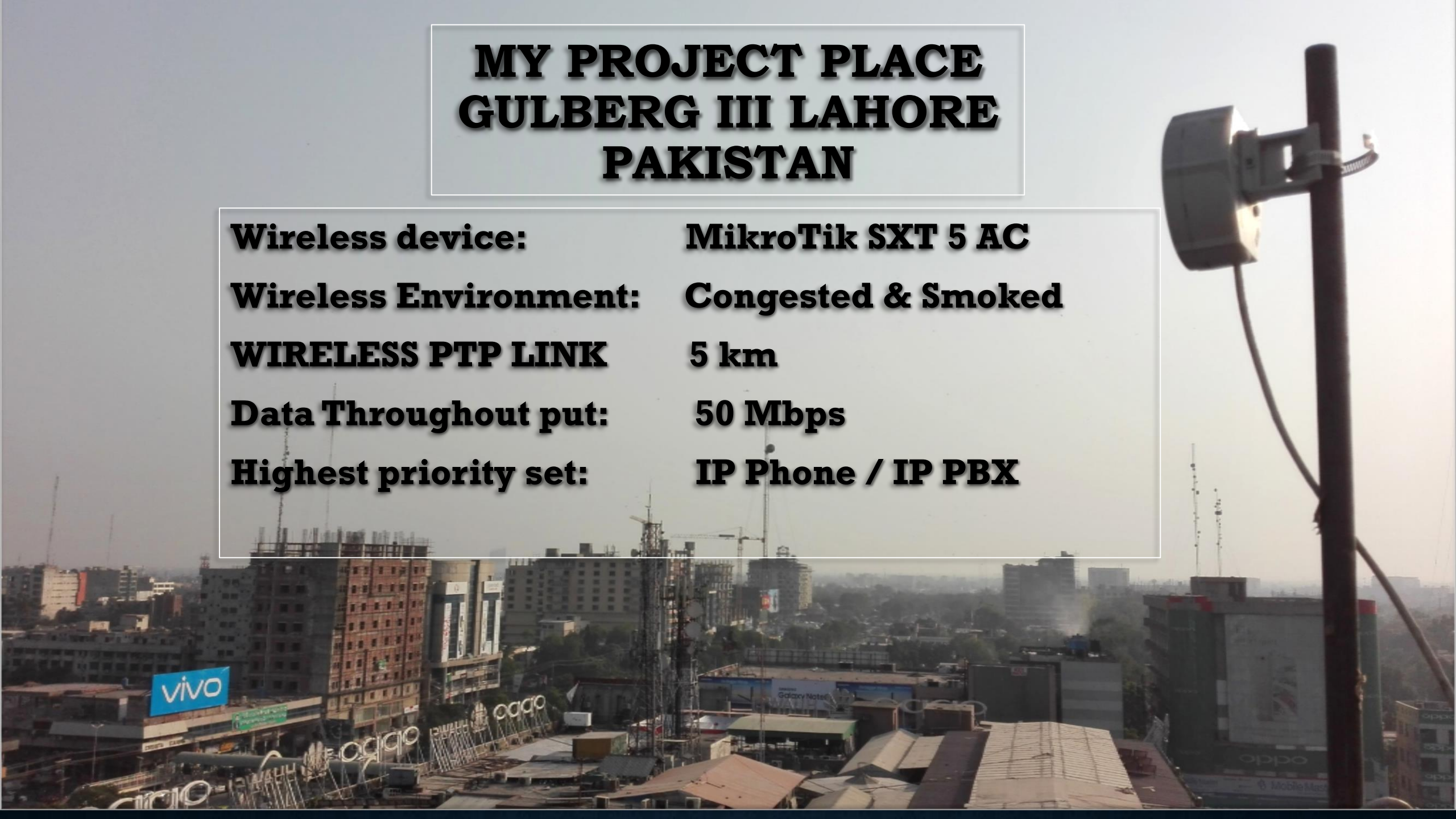
☐ Passthrough

CONFIGURATION TO BE USED...



MY PROJECT PLACE GULBERG III LAHORE PAKISTAN

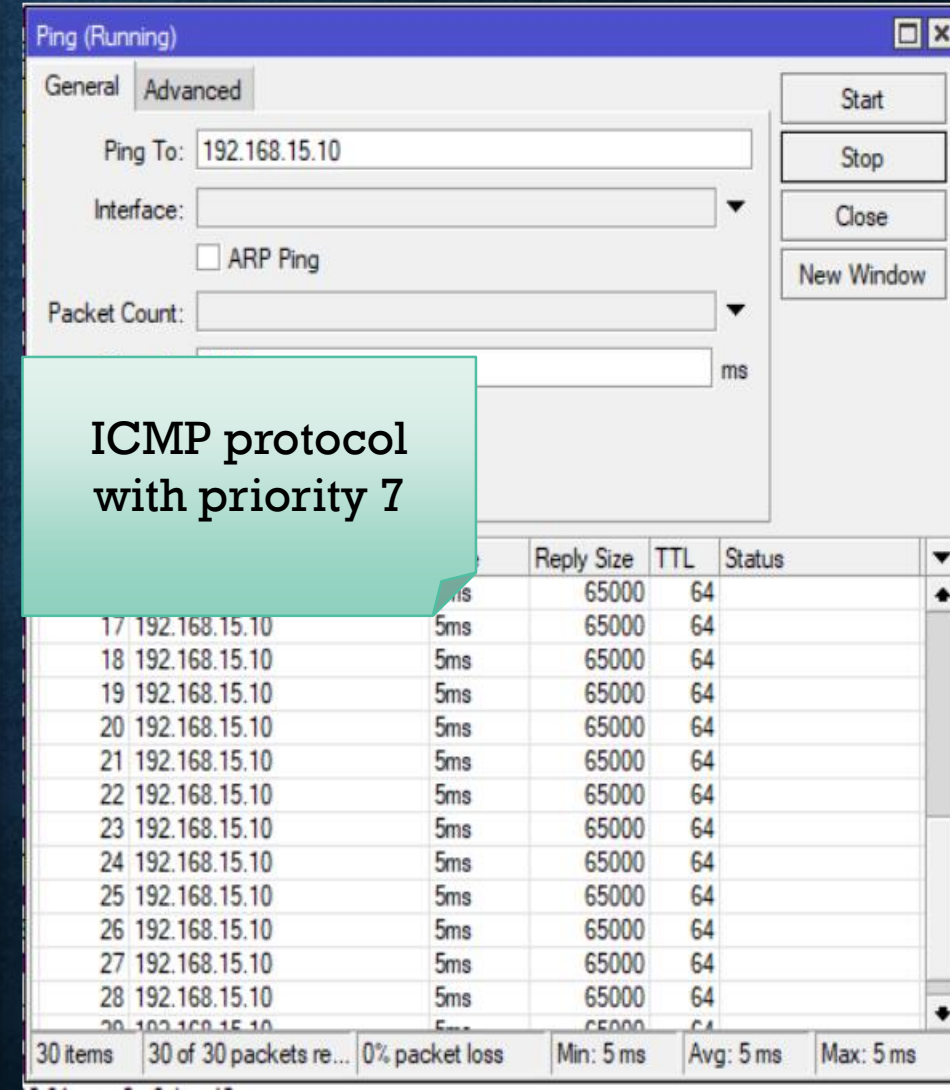
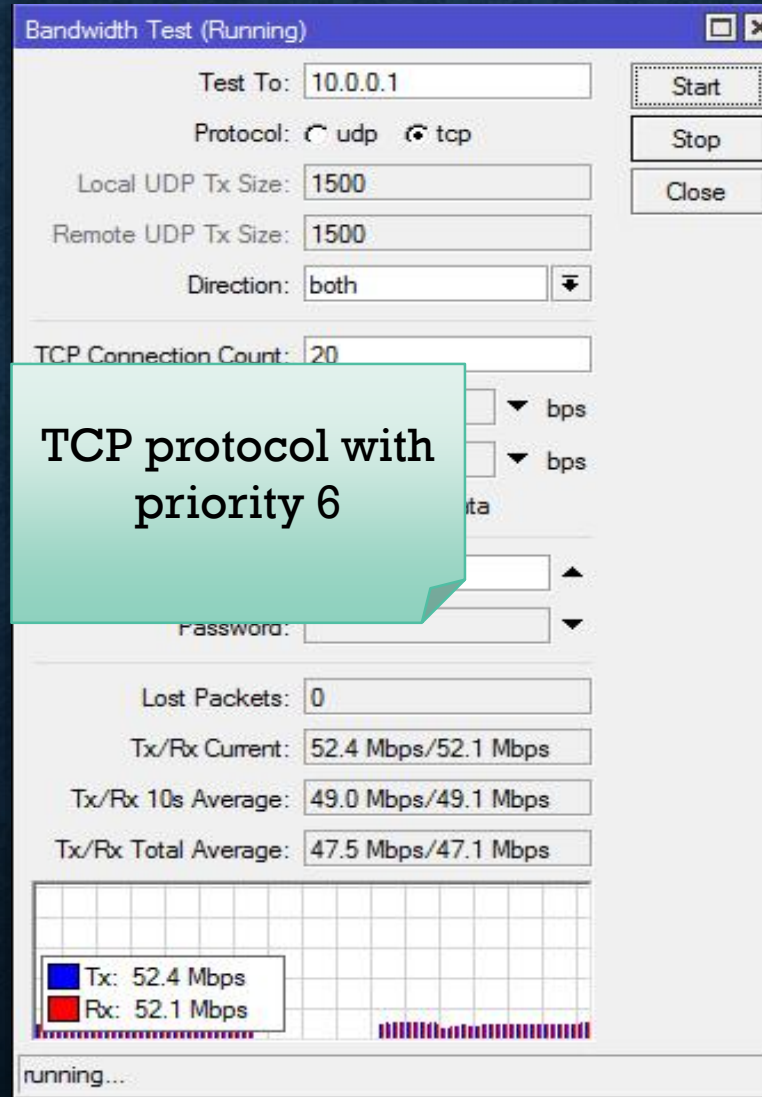
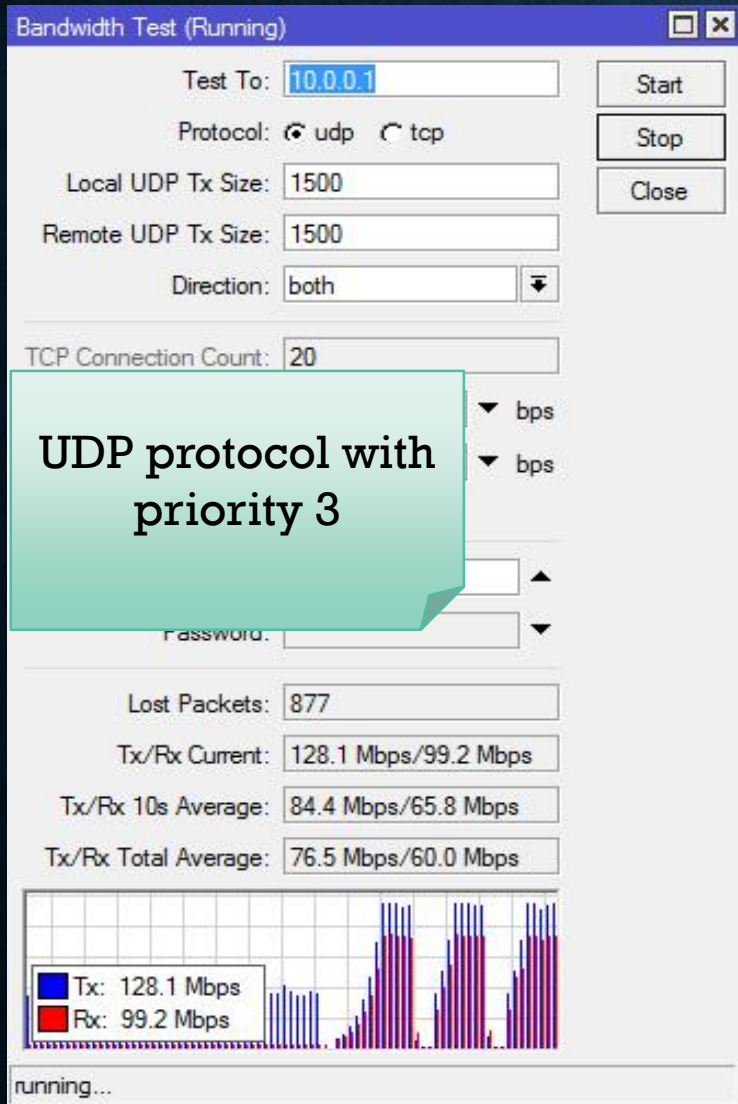
Wireless device:	MikroTik SXT 5 AC
Wireless Environment:	Congested & Smoked
WIRELESS PTP LINK	5 km
Data Throughout put:	50 Mbps
Highest priority set:	IP Phone / IP PBX



BRIDGE & BRIDGE STATION LINK STABILITY

Channel:	5765/20-Ceee/ac
Wireless Protocol:	nv2
Tx Rate:	433.3Mbps-80MHz/1S/SGI
Rx Rate:	292.5Mbps-80MHz/1S
SSID:	Tristar
BSSID:	4C:5E:0C:19:62:E1
Tx/Rx Signal Strength:	-59/-60 dBm
Tx/Rx Signal Strength Ch0:	-69/-62 dBm
Tx/Rx Signal Strength Ch1:	
Tx/Rx Signal Strength Ch2:	
Noise Floor:	-108 dBm
Signal To Noise:	68 dB
Tx/Rx CCQ:	100/76 %
Overall Tx CCQ:	
Distance:	5 km
RouterOS Version:	6.40.4
Last IP:	10.0.0.1

GOAL ACHIEVED



**NV2 QUEUES
WITH
HIGHEST
FRAME
PRIORITY (7)
(IP PHONE)
TCP LOGS**

[illegible]

MIKROTIK OS WIRELESS BRIDGE CONFIGURATION

BRIDGE CONFIGURATION

- First of all make a bridge interface and add ether1 port & wlan1 port on Both Devices one by one

The screenshot shows the Mikrotik WinBox interface for configuring a bridge. The left sidebar contains various configuration options, with 'Bridge' highlighted. The main window displays the 'Bridge' configuration page, which includes a table of existing bridges. A new bridge named 'bridge1' is listed with a type of 'Bridge'. The 'Ports' tab is selected, showing a list of ports added to the bridge. The ports 'ether1' and 'wlan1' are listed, both with a priority of 80 and a path cost of 10. The role of 'ether1' is 'designated port' and the role of 'wlan1' is 'disabled port'.

Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)	FP Tx
bridge1	Bridge	1598	107.5 kbps	4.5 kbps	10	10	

Interface	Bridge	Priority (h...)	Path Cost	Horizon	Role	Root Pat...
ether1	bridge1	80	10		designated port	
wlan1	bridge1	80	10		disabled port	

AP BRIDGE END CONFIGURATION

Wireless Tables

Name	Type	Actual MTU	Tx	Rx
wlan1	Wireless (Atheros AR9...	1500		
wlan2	Wireless (Atheros AR9...	1500		

Interface <wlan1>

General Wireless HT HT MCS WDS Nstreme NV2 Status ...

Mode: bridge

Band: 2GHz-only-N

Channel Width: 20/40MHz Ce

Frequency: 2412 MHz

SSID: MikroTik_LAB

Scan List: default

Wireless Protocol: nv2

Bridge Mode: enabled

Interface <wlan1>

Wireless HT HT MCS WDS Nstreme NV2 Status Traffic ...

WDS Mode: dynamic

WDS Default Bridge: bridge1

☐ WDS Ignore SSID

Interface <wlan1>

Wireless HT HT MCS WDS Nstreme NV2 Status Traffic ...

TDMA Period Size: 2ms

Cell Radius: 30 km

☐ Security

Preshared Key:

Mode: dynamic downlink

Downlink Ratio: 50 %

Sync Secret:

Queue Count: 8

QoS: frame priority

STATION BRIDGE END CONFIGURATION

Quick Set
CAPsMAN
Interfaces **1**
Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
New WinBox
Exit

Interface <wlan1> **2**

General **Wireless** HT HT MCS WDS Nstreme NV2 Advanced Status ...

Mode: station bridge **3**

Band: 2GHz-only-N **4**

Channel Width: 20/40MHz Ce **5**

Frequency: 2412 **6** MHz

SSID: MikroTik_LAB **7**

Scan List: default

Wireless Protocol: nv2 **8**

☒ Default Authenticate

Interface <wlan1>

HT HT MCS **WDS** **9** Nstreme NV2 Advanced Status Status Traffic ...

WDS Mode: dynamic **10**

WDS Default Bridge: bridge1 **11**

☐ WDS Ignore SSID

Interface <wlan1> **12**

HT HT MCS WDS Nstreme **NV2** Advanced Status Status Traffic ...

☐ Security

Preshared Key:

There is no Need to change anything

IP ADDRESS TO BRIDGE INTERFACES

This screenshot shows the Mikrotik WinBox interface. On the left sidebar, the 'IP' menu item is highlighted with a red circle and the number 1. In the main menu, the 'Addresses' option is highlighted with a red circle and the number 2. A red circle with the number 3 highlights the '+' icon in the 'Address List' window's toolbar. A red circle with the number 4 highlights the first entry in the table. A green callout box points to the table entry.

Address	Network	Interface
10.0.0.1/24	10.0.0.0	bridge1

AP bridge End IP address
10.0.0.1/24

This screenshot shows the Mikrotik WinBox interface. On the left sidebar, the 'IP' menu item is highlighted with a red circle and the number 1. In the main menu, the 'Addresses' option is highlighted with a red circle and the number 2. A red circle with the number 3 highlights the '+' icon in the 'Address List' window's toolbar. A red circle with the number 4 highlights the first entry in the table. A green callout box points to the table entry.

Address	Network	Interface
10.0.0.2/24	10.0.0.0	bridge1

Station bridge End IP
address
10.0.0.2/24

METHOD 1

**FRAME PRIORITY WITH
LAYER 2.**

IN BRIDGE FILTERS

UDP FRAME PRIORITY

The image shows the MikroTik WinBox interface with several components highlighted by red circles and numbers 1 through 14:

- 1**: Bridge tab in the left sidebar.
- 2**: Filters tab in the Bridge configuration window.
- 3**: Add button (+) in the Bridge Filters list.
- 4**: NAT tab in the Bridge configuration window.
- 5**: Chain dropdown menu set to 'forward'.
- 6**: MAC Protocol tab in the Bridge Filter Rule configuration window.
- 7**: MAC Protocol-Num dropdown menu set to '800 (ip)'.
- 8**: IP tab in the Bridge Filter Rule configuration window.
- 9**: Protocol dropdown menu set to '17 (udp)'.
- 10**: Action tab in the Bridge Filter Rule configuration window.
- 11**: Action dropdown menu set to 'set priority'.
- 12**: New Priority dropdown menu set to '3'.
- 13**: Passthrough checkbox checked.
- 14**: OK button in the Bridge Filter Rule configuration window.

The Bridge Filter Rule configuration window shows the following settings:

- Chain: forward
- MAC Protocol: 800 (ip)
- IP: 17 (udp)
- Action: set priority
- New Priority: 3
- Passthrough: checked

The Bridge configuration window shows the following settings:

- Bridge: Bridge
- Ports: Ports
- Filters: Filters
- NAT: NAT
- Hosts: Hosts

The Bridge Filters list shows one item:

#	Action	Chain	Interfaces...
0	set ...	forward	

TCP FRAME PRIORITY

The image shows the MikroTik WinBox interface with the following components and annotations:

- Left Sidebar:** A vertical menu with icons and labels for various system functions. The **Bridge** icon is circled in red and labeled with a red '1'.
- Main Window - Bridge Section:** The 'Bridge' tab is active. The 'Filters' sub-tab is circled in red and labeled with a red '2'. Below the tabs, a table lists filter rules. A red '+' icon is circled in red and labeled with a red '3'. The table has columns for '#', 'Action', 'Chain', and 'Interfaces'. It contains two entries: one with a green checkmark and 'set ...' action, and another with a green checkmark and 'set ...' action.
- Bridge Filter Rule Dialog:** A modal window titled 'Bridge Filter Rule <' is open. The 'General' tab is selected and circled in red, labeled with a red '4'. The 'Chain' dropdown is set to 'forward' and circled in red, labeled with a red '5'. The 'MAC Protocol' section is expanded, with 'MAC Protocol' circled in red and labeled with a red '6'. The 'MAC Protocol-Num' is set to '800 (ip)' and circled in red, labeled with a red '7'. The 'IP' section is expanded, with 'IP' circled in red and labeled with a red '8'. The 'Protocol' is set to '6 (tcp)' and circled in red, labeled with a red '9'. The 'OK' button is circled in red and labeled with a red '14'. The status at the bottom is 'enabled'.
- Bridge Filter Rule Dialog - Action Tab:** A second instance of the dialog is shown with the 'Action' tab selected and circled in red, labeled with a red '10'. The 'Action' dropdown is set to 'set priority' and circled in red, labeled with a red '11'. The 'Log' checkbox is unchecked. The 'Log Prefix' dropdown is set to an empty value. The 'New Priority' is set to '6' and circled in red, labeled with a red '12'. The 'Passthrough' checkbox is checked and circled in red, labeled with a red '13'.

ICMP (PING) FRAME PRIORITY

The image shows the MikroTik WinBox interface with the following components and annotations:

- Left Sidebar:** A vertical menu with icons and labels for various system functions. The **Bridge** icon is circled in red and labeled with a red '1'.
- Main Window - Bridge Tab:** The **Filters** sub-tab is selected and circled in red, labeled with a red '2'. Below it, a table lists filter rules. Rule #2 is selected (highlighted in blue) and labeled with a red '3'.

#	Action	Chain	Interfaces...
0	✓ set ...	forward	
1	✓ set ...	forward	
2	✓ set ...	forward	
- Bridge Filter Rule Dialog:** A modal window titled 'Bridge Filter Rule <>' is open. The **General** tab is selected and circled in red, labeled with a red '4'.
 - Chain:** Set to 'forward', circled in red and labeled with a red '5'.
 - MAC Protocol:** Expanded and circled in red, labeled with a red '6'. Below it, 'MAC Protocol-Num' is set to '800 (ip)', circled in red and labeled with a red '7'.
 - IP:** Expanded and circled in red, labeled with a red '8'. Below it, 'Protocol' is set to '1 (icmp)', circled in red and labeled with a red '9'.
 - Buttons:** The 'OK' button is circled in red and labeled with a red '14'.
- Bridge Filter Rule - Action Tab:** A second dialog window is shown, titled 'Bridge Filter Rule <>', with the **Action** tab selected and circled in red, labeled with a red '10'.
 - Action:** Set to 'set priority', circled in red and labeled with a red '11'.
 - New Priority:** Set to '7', circled in red and labeled with a red '12'.
 - Passthrough:** The checkbox is checked, circled in red and labeled with a red '13'.

LOG SETTING TO CONFIRM ICMP PRIORITY IN BRIDGE FILTER RULE

The screenshot illustrates the configuration of a Bridge Filter Rule in MikroTik WinBox. The interface is divided into a left sidebar, a main configuration area, and a right sidebar.

Left Sidebar: Contains various system and network management tools. The **Bridge** icon is highlighted with a red circle and the number 1. The **Log** icon is also visible.

Main Configuration Area: The **Bridge** tab is selected, and the **Filters** sub-tab is active, indicated by a red circle and the number 2. A table lists existing filter rules:

#	Action	Chain	Interfaces..
0	✓ set ...	forward	
1	✓ set ...	forward	
2	✓ set ...	forward	
3	log	forward	

The **Bridge Filter Rule** dialog box is open, showing the **General** tab. The **Chain** is set to **forward** (5). The **MAC Protocol** is selected (6), and the **MAC Protocol-Num** is set to **800 (ip)** (7). The **IP** tab is also visible (8). The **Protocol** is set to **1 (icmp)** (9). The **OK** button is highlighted with a red circle and the number 12.

Right Sidebar: A table displays statistics for the filter rule, with the **Log** tab selected (10). The **Action** is set to **log** (11).

Bottom Panel: A smaller version of the **Bridge Filter Rule** dialog box is shown, highlighting the **Action** tab (10) and the **log** action (11).

LOGS

- Interfaces
- Wireless
- Bridge
- PPP
- Switch
- Mesh
- IP
- MPLS
- Routing
- System
- Queues
- Files
- Log**
- Radius
- Tools
- New Terminal
- MetaROUTER

Log			
Freeze		all	
Jan/02/1970 00:00:21	memory	system, error, critical	router was rebooted without proper shutdown
Jan/02/1970 00:00:32	memory	poe-out, info	ether5 detected poe-out status: on
Jan/02/1970 00:00:35	memory	interface, info	ether5 link up (speed 100M, full duplex)
Jan/02/1970 00:00:50	memory	interface, info	ether5 link down
Jan/02/1970 00:00:53	memory	wireless, info	6C:3B:6B:05:C4:23@wlan1: connected
Jan/02/1970 00:01:00	memory	interface, info	ether5 link up (speed 100M, full duplex)
Jan/02/1970 14:02:06	memory	interface, info	ether3 link up (speed 100M, full duplex)
Jan/02/1970 14:03:05	memory	system, info, account	user admin logged in from B8:2A:72:BF:5E:A5 via winbox

METHOD 2

**FRAME PRIORITY WITH
LAYER 3**

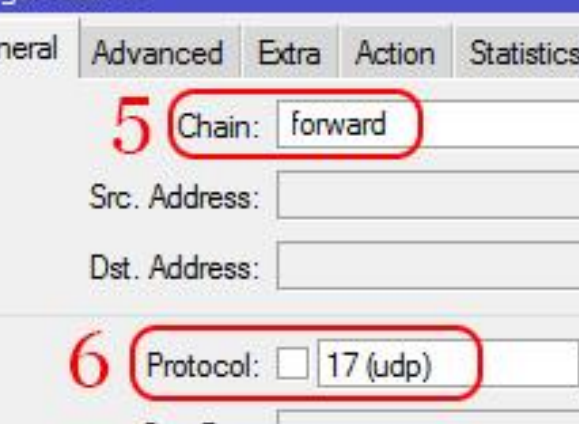
IN IP FIREWALL MANGLE

UDP FRAME PRIORITY

Wireless	ARP
Bridge	Accounting
PPP	Addresses
Switch	Cloud
Mesh	DHCP Client
IP	DHCP Relay
MPLS	DHCP Server
Routing	DNS
System	Firewall
Queues	Hotspot
Files	IPsec
Log	Neighbors
Radius	Packing
Tools	Pool
New Terminal	Routes
MetaROUTER	SMB
Partition	SNMP
Make Supout.tif	Services
Manual	Settings
New WinBox	Socks
Exit	TFTP

The screenshot shows the Mikrotik WinBox Firewall configuration window. The 'Mangle' tab is selected. A new rule is being added, indicated by a red circle around the '+' icon and a red '4'. The rule configuration table is as follows:

#	Action	Chain	Src. Address	Dst. Address	Protocol
0	✓ set priority	output			17 (udp)



Mangle Rule <>

General Advanced Extra Action Statistics

5 Chain: forward

Src. Address:

Dst. Address:

6 Protocol: 17 (udp)

Src. Port:

Mangle Rule <>

General Advanced Extra **Action** Statistics

8 Action: set priority

☐ Log

Log Prefix:

9 New Priority: 3

10 ☒ Passthrough

TCP FRAME PRIORITY

Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.nf
Manual
New WinBox
Exit

ARP
Accounting
Addresses
Cloud
DHCP Client
DHCP Relay
DHCP Server
DNS
Firewall
Hotspot
IPsec
Neighbors
Packing
Pool
Routes
SMB
SNMP
Services
Settings
Socks
TFTP

Firewall

Filter Rules NAT Mangle Raw Service Ports Connections Address Lists Lay

+ 4

00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Sr
0	✓ set priority	output			17 (udp)	
1	✓ set priority	output			6 (tcp)	

Mangle Rule

General Advanced Extra Action Statistics

Chain: forward

Src. Address:

Dst. Address:

Protocol: 6 (tcp)

Src. Port:

Dst. Port:

Any. Port:

Mangle Rule

General Advanced Extra Action Statistics

Action: set priority

Log

Log Prefix:

New Priority: 6

✓ Passthrough

ICMP (PING) FRAME PRIORITY

Wireless
Bridge
PPP
Switch
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Firewall

Filter Rules NAT Mangle Raw Service Ports Connections Address Lists

+ 4

00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	S
0	✓ set priority	output			17 (udp)	
1	✓ set priority	output			6 (tcp)	
2	✓ set priority	output			1 (icmp)	

Mangle Rule <>

General Advanced Extra Action Statistics

5 Chain: forward

Src. Address:

Dst. Address:

6 Protocol: 1 (icmp)

Src. Port:

Mangle Rule <>

General Advanced Extra Action Statistics

8 Action: set priority

☐ Log

Log Prefix:

9 New Priority: 7

10 ☒ Passthrough

LOG SETTING TO CONFIRM ICMP PRIORITY IP FIREWALL FILTER

The screenshot displays the MikroTik WinBox interface for configuring a Firewall Filter Rule. The steps are numbered 1 through 9:

1. Select **IP** in the left sidebar.
2. Select **Firewall** in the left sidebar.
3. Click the **Filter Rules** tab in the Firewall configuration window.
4. Click the **+** button to add a new rule.
5. Select the **General** tab in the Firewall Rule configuration window.
6. Set the **Chain** to **forward**.
7. Set the **Protocol** to **1 (icmp)**.
8. Select the **Action** tab in the Firewall Rule configuration window.
9. Set the **Action** to **log**.

The Firewall configuration window shows the following table:

#	Action	Chain	Src. Address	Dst. Address	Proto...	Src. Port	Ds...
0	log	output			1 (ic...		

The Firewall Rule configuration window shows the following settings:

- General tab selected.
- Chain: forward
- Protocol: 1 (icmp)
- Action tab selected.
- Action: log

USE OF FIREWALL IN BRIDGE

The screenshot displays the MikroTik WinBox interface. On the left sidebar, the 'Bridge' menu item is highlighted. The main window shows the 'Bridge' configuration page for 'bridge1'. The 'Settings' tab is selected, and the 'Settings' button in the toolbar is also highlighted. A 'Bridge Settings' dialog box is open, showing the following options:

- ☒ Use IP Firewall
- ☐ Use IP Firewall For VLAN
- ☐ Use IP Firewall For PPPoE
- ☒ Allow Fast Path
- ☒ Bridge Fast Path Active

Below these options, there are input fields for 'Bridge Fast Path Packets' (set to 0) and 'Bridge Fast Path Bytes' (set to 0 B). The 'OK' button is highlighted. The background table lists the bridge configuration:

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
R	bridge1	Bridge	1598	0 bps	0 bps	0	

At the bottom left, it indicates '1 item out of 8'.

LOGS

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Log				
Freeze				all
Jan/02/1970 00:00:21	memory	system, error, critical	router was rebooted without proper shutdown	
Jan/02/1970 00:00:32	memory	poe-out, info	ether5 detected poe-out status: on	
Jan/02/1970 00:00:35	memory	interface, info	ether5 link up (speed 100M, full duplex)	
Jan/02/1970 00:00:50	memory	interface, info	ether5 link down	
Jan/02/1970 00:00:53	memory	wireless, info	6C:3B:6B:05:C4:23@wlan1: connected	
Jan/02/1970 00:01:00	memory	interface, info	ether5 link up (speed 100M, full duplex)	
Jan/02/1970 14:02:06	memory	interface, info	ether3 link up (speed 100M, full duplex)	
Jan/02/1970 14:03:05	memory	system, info, account	user admin logged in from B8:2A:72:BF:5E:A5 via winbox	

CONCLUSION

MikroTik OS Base Wireless Bridge is more reliable, Stronger & Faster than all existing Wireless PTP Bridge Link in Congested Environment as I've Tested

THANK YOU

**ANY QUESTION
PLEASE**