# RAPIDUS

RAPIDUS WIRELESS NETWORKS

# RAPIDUS WIRELESS RL-SERIES USER GUIDE

COVERS INDOOR AND OUTDOOR SERIES MODELS

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## **Rapidus Wireless Networks**

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# **About Rapidus Wireless Networks**

The company's dedication to customer satisfaction provides comprehensive solutions with superior products. Whether you are in the market for connectors or a complete network of high speed wireless access points or mesh products, Rapidus is the answer. With over 75 years of combined experience in the wireless field, our team of experts have installed wireless systems worldwide. We provide product selection assistance and rapid product delivery backed by knowledgeable support.



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ROUTER	
VLAN	



# **QUICK START**

## **COMPUTER CONFIGURATION/INSTALL GUIDE**

#### Step 1:

Connect an Ethernet cable from the PC/Laptop to the PC connector on the POE LAN port.

#### Step 2:

Connect an Ethernet cable from the RL-Series device (radio) to the POE port on the POE.

#### Step 3:



Connect a PC to the "LAN" port of the POE, with a straight through Ethernet cable

Note: Connect the device (radio) to the "POE" port and the "LAN" port to PC/switch/router. Power the POE unit

#### Step 4:

#### Connecting to the device (radio)

Before accessing the configuration interface, you have to change the network connection setting in your computer to be on the same subnet as the device (radio). Alternatively, you could use the RapiFind Utility program to assign the device (radio) a temporary IP alias that is on the same subnet as your computer.

#### Changing the IP address – Windows 8

1. In your computer, open Control Panel > Network and Sharing Center then click change adaptor settings on the left hand menu. Select and right click the Ethernet icon.



- 2. Then click Properties.
- 3. In the Ethernet Properties > Networking tab, select Internal Protocol Version 4 (TCP/IPv4)



Ethernet Properties	x				
Networking					
Connect using:					
Pealtek PCIe GBE Family Controller					
Configure					
This connection uses the following items:					
🗹 🚚 QoS Packet Scheduler					
Microsoft Network Adapter Multiplexor Protocol					
Microsoft LLDP Protocol Driver					
Link-Layer Topology Discovery Mapper I/O Driver	=				
Link-Layer Topology Discovery Responder	=				
Internet Protocol Version 6 (TCP/IPv6)					
Internet Protocol Version 4 (TCP/IPv4)	~				
< III >					
Install Uninstall Properties					
Description	— II				
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.					
	- 1				
OK Can	cel				

- 4. In the Internet Protocol (TCP/IP) properties > General, select Use the following IP address.
- 5. Enter your **IP address** and **Subnet Mask (255.255.255.0).** The default IP address of the radio is 192.168.1.99, which cannot be used here. Use anything else in the same subnet, the IP address of the computer can be any IP varied from 192.168.1.2 to 192.168.1.254

Internet Protocol Version	4 (TCP/IPv4) Properties	х			
General					
	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.				
Obtain an IP address automatical	у				
• Use the following IP address:					
IP address:	192 . 168 . 1 . 100				
Subnet mask:	255.255.255.0				
Default gateway:					
Obtain DNS server address autom	natically				
• Use the following DNS server add	resses:				
Preferred DNS server:					
Alternate DNS server:					
Validate settings upon exit	Advanced				
	OK Cance				

6. Click OK and Close

#### Step 5:

Configuration of RL-Series device features and option are accessible via the web page.

- 1. Open your internet browser (such as Internet Explorer, Chrome, or Firefox).
- 2. In the address bar, type your IP address (default IP: 192.168.1.99)
- 3. In the login dialog, enter your Username and Password. (default Username: Root; no Password is required)
- 4. Click OK, you will then access the configuration interface. Setup and Configuration via web GUI.

Default IP Address	192.168.1.99
Default Username	Root
Default Password	*No Password Required*



# **UPGRADE**

## **UPGRADE FIRMWARE HOW-TO**

The following steps will detail the process of updating/upgrading your current firmware to the latest released firmware supported by Rapidus Wireless Networks. This manual shows the process on how to update the firmware on your device.

To begin your firmware update please go System > Maintenance.

Rapidus Status -	System - Network -	HotSpot Logout Auto REFRES
Go to password configu		gure a root password to protect the web interface and enable SSH.
Status	Maintenance Reboot	
Hostname		Rapidus
Model		Rapidus Wireless RL Series
Firmware Version		RL-K r3 r3311+7-fb18c3c / LuCl branch (git-17.090.64489-eb806fb)
Kernel Version		4.4.47
Local Time		Wed Apr 12 20:24:08 2017
Uptime		0h 2m 53s
Load Average		0.42, 0.39, 0.17
Memory		
Total Available		74996 kB / 125384 kB (59%)
Free		71748 kB / 125384 kB (57%)

You will be directed to the following page.

F	Rapidus Status - System - Network - HotSpot Logout
ſ	Maintenance       Actions     Configuration
c	Backup / Restore Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" (only possible with squashfs images). Download backup: Generate archive Reset to defaults:
т	fo restore configuration files, you can upload a previously generated backup archive here. Restore backup: Choose File No file chosen II Upload archive
ι	Elash new firmware image Jpload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires a compatible imware image). Keep settings: Image: Choose File No file chosen Flash image



Under the "Flash new firmware image" section, click "Choose File" to select the new firmware that will be supplied by Rapidus Wireless Networks. Be sure to check the "Keep settings" box, your device will default to factory settings if this box is not checked. (The latest firmware updates will either be sent by email upon request or they can be downloaded from our website at www.rapiduswireless.com).

Rapidus Status - System - Network - HotSpot Logout	<u> </u>
Maintenance Actions Configuration	
Backup / Restore	
Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" (only possible with squashfs images).	
Download backup: I Generate archive Reset to defaults: I Perform reset	
To restore configuration files, you can upload a previously generated backup archive here.	
Restore backup: Choose File No file chosen Upload archive	
Flash new firmware image	
Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires a compatible firmware image). Keep settings:	
Image: Choose File No file chosen	
Flash image	

Select the most current firmware update that you have downloaded or have been supplied by from the Rapidus Wireless Networks support team.

🏮 Open							×
Computer + Lo	ocal Disk (C:) 🝷 Programl	Data 🔻 Rapidus			🔻 🚱 Search	ı Rapidus	2
Organize 🔻 New folder							
★ Favorites	Name 🗠			Determedified	Туре	Size	
	🛛 📥 lede-ar71xx-gen	eric-wpj344-16M-squashfs	-sysupgrade-39.bin	03/11/2016 2:59 PM	VLC media file (.bin)	4,545 KB	
🧮 Desktop							
ᇘ Libraries							
强 mrex							
🖳 Computer							
Can RAMDisk (B:)							
🚰 Local Disk (C:)							
🛛 🕅 Data (D:)							
🔮 BD-ROM Drive (E:)							
🙀 unlock_single_just_ip:							
🙀 Rapidus (\\192.168.1							
SFTP on 192.168.123							
👊 Network 🗾							
File <u>n</u> ame:	: lede-ar71xx-generic-	wpj344-16M-squashfs-s	ysupgrade-39.bin		▼ All File	5	•
					Qp	en 🔻 🔿	Cancel



Once you have selected our latest firmware update click "Flash Image"

<b>Rapidus</b> Status - Sy	stem - Network - HotSpot Logout
Actions Configuration	
Backup / Restore Click "Generate archive" to down with squashfs images). Download backup: Reset to defaults:	Noad a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" (only possible Generate archive Perform reset
To restore configuration files, yo Restore backup:	u can upload a previously generated backup archive here.  Choose File No file chosen  Upload archive
Flash new firmware in Upload a sysupgrade-compatible firmware image). Keep settings: Image:	Image       Image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires a compatible         Image       Choose File       rt-k-r3-r331sysupgrade         Image       Image

You will be directed to the following page. Please click "Proceed" to finish your update.

No password set! There is no password set on this router. Please configure a root password to protect the web interface and enable SSH. Go to password configuration	
Flash Firmware - Verify The flash image was uploaded. Below is the checksum and file size listed, compare them with the original file to ensure data integrity. Click "Proceed" below to start the flash procedure.	
<ul> <li>Checksum MD5: 231c4ab423d31c65d2ef09103d314508 SHA256: dbbf3s80e281f50538269cc364dbb0977ac57bf9239e7f6c706c841f1601c0a</li> <li>Size: 4.75 MB (15.75 MB available)</li> <li>Configuration files will be kept.</li> </ul>	
Cancel	
Powered by LuCl branch (git-17.090.64489-eb806fb) / RL-K r3 r3311+7-fb18c3c	

You have now completed the process of updating your radio to our latest firmware. If you find you are having issues or the process is not configuring correctly contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.



# WIFI/MESH

## **CONFIGURATION MOBILE MESH HOW-TO**

#### **Configure Wireless Settings**

To getting started on configuring a Mobile Mesh network, begin by Clicking on Network > Wireless.

Rapidus Status - System -	Network - Logout	AUTO REFRESH ON
Status 🗾	Interfaces Wireless	
System	DHCP and DNS Hostnames	
Hostname	Static Routes	
Model	Firewall RL Series Diagnostics	
Firmware Version	RL r 2-A45 r22927 LuCI Master (git-16.324.51057-1c27f6b)	
Kernel Version	4.4.32	
Local Time	Tue Mar 28 19:39:28 2017	
Uptime	0h 39m 28s	
Load Average	0.01, 0.02, 0.00	

Click the "Edit" button for the radio that you choose to be used for the Mobile Mesh

Rapidus Status	- System - Network -	HotSpot Logout				AUTO REFRESH ON
radio0: Master "Rapidu	us" radio1: Master "Rap	idus"				
Wireless Ove	erview					
	m Atheros QCA9880 8 36 (5. 180 GHz)   Bitrate: ? M		00)		Scan	Add
0%	SSID: Rapidus   Mode: M BSSID: 04:F0:21:1D:7A:8	Ø Disable	Z Edit	× Remove		
	MAC80211 802.11bgn I1 (2.462 GHz)   Bitrate: ? M				Scan	Add
0%	SSID: Rapidus   Mode: M BSSID: 04:F0:21:1F:EC:1			Disable	Z Edit	Remove
Associated S	Stations					
SSID	MAC-Address	Host	Signal / Noise	RX Ra	ite / TX Rate	
No information availab	ble					
Powered by LuCl branch	(git-17.088.09695-726efc9) /	RL-K r3-rc2 r3311+5-fb	18c3c			



In the Device Configuration > General Setup Tab, Select the channel that you will be operating on and choose between 20MHz, 40MHz or 80Mhz.

<b>Rapidus</b> Status <del>-</del> Syst	em - Network - HotSpot Logout						
radio0: Master "Rapidus"	adio1: Master "Rapidus"						
Wireless Network	: Master "Rapidus" (wlan0)						
The Device Configuration section of	covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared among all dio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the <i>Interface</i>						
Device Configuration							
General Setup Advanced S	Settings						
Wireless network is enabled	Disable						
Operating frequency	Mode         Channel         Width           AC         •         157 (5785 MHz) •         40 MHz •           20 MHz         •         •						
	auto 40 MHz 80 MHz						
	dBm						
Interface Configuration							
General Setup Wireless Set	General Setup Wireless Security MAC-Filter Advanced Settings						
ESSID	Rapidus						
Mode	Access Point v						

In the Interface Configuration > General Setup Tab, Change your ESSID name to your preference and select "Mobile Mesh" from the "Mode" dropdown options.

Rap	<b>bidus</b> Status <del>-</del> Sys	stem + Network + HotSpot Logout
	rface Configuration	
	ESSID	Rapidus
	Mode	Access Point •
	Network	Access Point Client Mobile Mesh Access Point (WDS) Client (WDS)
		□ mesh: wan: create:
		Choose the network(s) you want to attach to this wireless interface or fill out the create field to define a new network.
	Hide ESSID	
	WMM Mode	8
	🖷 Ba	ack to Overview Save & Apply Save Reset



In the Network section you must unselect "Lan".

Rapidus st	atus + System + Network + HotSpot Logout
Interface Con General Setup	figuration Wireless Security Advanced Settings
	ESSID Rapidus
	Mode Mobile Mesh T
	Network hotspot: (no interfaces attached)
	mesh:  wan:
	create:     create:     Choose the network(s) you want to attach to this wireless interface or fill out the create field to define a new network.
	Back to Overview     Save & Apply     Save     Reset
Doworod by LuCl br	anch (nit 17 088 00605 736nfrs) / DL V r3 rc2 r3311+6 fb18c3c

Select "mesh" then click "Save & Apply" to save these changes

Rapidus Status - System - Network - HotSpot Logout	
Interface Configuration	
General Setup Wireless Security Advanced Settings	
ESSID Rapidus	
Mode Mobile Mesh v	
BSSID	
Network     Interfaces attached)       Inn: 2 2 2 2 2	
mesh: 👳	
van: 2	
Choose the network(s) you want to attach to this wireless interface or fill out the create field to define a new network.	
Back to Overview Save & Apply Save Reset	
Powered by LuCi branch (git-17.088.09695-726efc9) / RL-K r3-rc2 r3311+5-fb18c3c	



#### Click Network > Interface

Rapidus	Status <del>-</del> Syste	em - Network -	HotSpot Logout				AUTO REFRESH ON
radio0: Mobi	le Mesh "Rapidus"	Interfaces ra Wireless	-				
Wireless	s Overviev	DHCP and D Hostnames Static Route					
	Qualcomm Athe Channel: 157 (5.785		(radio0	))		🖸 Scan	Add 📩
		GID: Rapidus   Mode: SID: 30:31:32:33:34:			Ø Disable	Edit	Remove
		2 <b>11 802.11bgn (ra</b> GHz)   Bitrate: ? Mbit/				🖸 Scan	Add
		Rapidus   <b>Mode:</b> Mast 04:F0:21:1F:EC:1C			🙆 Disable	Z Edit	× Remove
Associa	ted Statio	ns					
	SSID	MAC-Address	Host	Signal / Noise	RX Ra	te / TX Rate	
👷 wlan0	Rapidus	04:F0:21:30:AF	65 ?	-24 / -105 dBm		lbit/s, 40MHz, M0 lbit/s, 40MHz, M0	
Powered by Lu	CI branch (git-17.088	8.09695-726efc9) / RL	-K r3-rc2 r3311+5-fb18	ic3c			

### When directed to the "Interfaces" page, click "Edit"

Rapidus Status - System	v → Network → HotSpot Logout	AUTO REFRESH ON						
WAN MESH HOTSPOT	LAN							
Interfaces	Interfaces							
Interface Overview								
Network	Status	Actions						
HOTSPOT		🖉 Connect 🔞 Stop 🛛 Edit 🗙 Delete						
hotspot	Unsupported protocol type. Install protocol extensions							
MESH	Uptime: 0h 1m 22s MAC-Address: 04:F0:21:1D:7A:8C	💋 Connect 🔞 Stop 🛛 🖉 Edit 💌 Delete						
Mobile Mesh "Rapidus"	RX: 12.17 KB (163 Pkts.) TX: 16.04 KB (171 Pkts.)							
LAN	Uptime: 1h 44m 14s MAC-Address: 04:F0:21:1D:7A:8C	🖉 Connect 🔞 Stop 🛛 🛛 Edit 💌 Delete						
) (月三國) br-lan	RX: 12.70 MB (112901 Pkts.) TX: 3.34 MB (19427 Pkts.)							
	IPv4: 192.168.123.44/24 IPv6: fd7a:7d4e:7630::1/60							
WAN		💈 Connect 🔞 Stop 🛛 Edit 💌 Delete						
none	RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.)							



#### Please click on the "Physical Setting" Tab

Rapidus Statu	s <del>▼</del> System <del>▼</del>	Network - HotSpot Lo	.ogout AUTO REFRESH ON							
WAN MESH	HOTSPOT	LAN								
On this page you can o	terfaces - LAN this page you can configure the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several vork interfaces separated by spaces. You can also use <u>VLAN</u> notation INTERFACE.VLANNR (e.g.: eth0.1).									
Common Config	guration									
General Setup	Advanced Settings	Physical Settings	Firewall Settings							
	Status	br-lan MAC-A RX: 12. TX: 3.4 IPv4: 1	e: 1h 44m 42s Address: 04:F0:21:1D:7A:8C 2.78 MB (113609 Pkts.) 43 MB (19668 Pkts.) 192:168:123.44/24 167a:7d4e:7630::1/60							
	Protocol Static a	ddress v	•							
IPv4	address 192.168	3.123.44								
IPv4 r	etmask 255.255	5.255.0 <b>v</b>								
IPv4	gateway									
IPv4 br	oadcast									

Then Select "Ethernet Adapter: "bat0"". Then save and apply by clicking "Save & Apply"

Rapidus si	tatus	stem + I	Network + HotSpot	Logout	AUTO REFRESH ON
WAN MESH	н нота	POT	LAN		
Interfaces	- LAN				
				e several interfaces by ticking the "bridge interfaces" field and enter the n TERFACE.VLANNR (e.g.: eth0.1).	ames of several network
Common Cor	nfiguratio	n			
General Setup	Advanced		Physical Settings	Firewall Settings	
Bridg	e interfaces	🗹 👩 c	reates a bridge over spe	cified interface(s)	
E	Enable STP	🗆 👩 E	nables the Spanning Tre	ee Protocol on this bridge	
	Interface		Ethernet Adapter: "bat0"		
			Ethernet Adapter: "eth0"		
			Ethernet Adapter: "eth1"		
			Ethernet Adapter: "none"		
		Electron and a second	Ethernet Adapter: "teql0' Wireless Network: Ad-H		
			Wireless Network: Ad-H		
			Custom Interface:	a rapidus (ian)	
DHCP Serve	r				
General Setup	IPv6 Sett	ngs			
Igno	ore interface	e 💿 🖸	isable DHCP for this int	leface.	
	в	ack to Ove	rview	Save & Apply	Save Reset



Please Click Status > Overview.

Rapidus Status - System	n <del>▼</del> Network <del>▼</del> HotSpot Logout		(	AUTO REFRESH ON
WAN M <sup>6</sup> Overview Firewall Routes System Log	AN			
Interface C Kernel Log Processes				
Network Realtime Graphs	atus	Actions		
HOTSPOT	Unsupported protocol type. Install protocol extensions	Stop	Edit	x Delete
MESH	Uptime: 0h 0m 60s	🛿 Connect 🔕 Stop	Edit	x Delete
Mobile Mesh "Rapidus"	MAC-Address: 04:F0:21:1D:7A:8C RX: 26.81 KB (237 Pkts.) TX: 331.19 KB (2006 Pkts.)	S connect		A Delete
LAN	Uptime: 0h 1m 5s	💋 Connect 🛛 🔕 Stop	Z Edit	× Delete
愛译( <u>()</u> () () () br-lan	MAC-Address: 0E:08:98:34:65:5C RX: 212.98 KB (1810 Pkts.) TX: 224.31 KB (705 Pkts.) IPv4: 192, 168:123.44/24 IPv6: fd7a:7d4e:7630::1/60			
WAN D none	RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.)	🖉 Connect 🔯 Stop	Edit	x Delete
Add new interface				

In the Section "Associated Stations" at the bottom of the page, you will see the devices that are connected to your mesh network. (2 or more devices need to be configured to MESH mode setting for you to be able to see them under "Associated Stations")

	o active leases.				
Wireless					
Generic 802	2.11ac Wireless Controller (radio0	100% Mode: Mot Channel: 1 Bitrate: 30	ile Mesh 57 (5.785 Gł 0 Mbit/s 31:32:33:34:		
Generic 802	2.11bgn Wireless Controller (radio	0% Mode: Mas Channel: 1 Bitrate: ? N	ter 1 (2.462 GHz /lbit/s F0:21:1F:EC		
Associate	ed Stations				
Associate	ed Stations Network	MAC-Address	Host	Signal / Noise	RX Rate / TX Rate 300.0 Mbit/s, 40MHz, MCS 15, Short GI

You have now completed the process of creating your Mobile-Mesh Network setup and can continue to configure more units to your network. If you find you are having issues you can contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.



# **ACCESS POINT**

# **CONFIGURATION AP HOW-TO**

#### **Configuring AP Settings**

This section will show you how to set up and configure an AP on your desired radio unit.

To begin configuring your AP, please go to the "Network" Tab and select "Wireless" from the pull-down tab.

Rapidus Status - System -	Network - Logout	AUTO REFRESH ON
	Interfaces	
No password set!	Wireless	
There is no password set on this router	DHCP and DNS ssword to protect the web interface and enable SSH.	
Go to password configuration	Hostnames	
	Static Routes	
Status	Firewall	
System	Diagnostics	
Hostname	Rapidus	
Model	Rapidus Wireless RL Series	
Firmware Version	RL r 2 r2292 / LuCl Master (git-16.324.51057-1c27f6b)	
Kernel Version	4.4.32	
Local Time	Tue Nov 22 09:52:43 2016	
Uptime	0h 1m 55s	
Load Average	0.44, 0.27, 0.10	
Memory		
Total Available	90188 kB / 125352 kB (71%)	
Free	87620 kB / 125352 kB (69%)	

You will be directed to the following page, once here click "Edit" on the radio you are configuring to be your AP.

Rapidus	Status - System - Network - Logout					AUTO REFRESH ON
	word set! password set on this router. Please configure a root password to protect the web interface and word configuration	d enable	SSH.			
Wireles	s Overview					
	Qualcomm Atheros QCA9880 802.11bgnac (radio0) Channel: 36 (5.180 GHz)   Bitrate: ? Mbit/s			۵	Scan	Add
la l	SSID: LEDE   Mode: Master BSSID: 04:F0:21:1D:7A:8C   Encryption: None	8 [	Disable		Edit	Remove
	Generic MAC80211 802.11bgn (radio1) Channel: 11 (2.462 GHz)   Bitrate: ? Mbit/s			٩	Scan	Add 1
a a	SSID: LEDE   Mode: Master BSSID: 04:F0:21:1F:EC:1C   Encryption: None	8	Disable		Edit	× Remove



When directed to the following page, in the "Device Configuration" section under the "General Setup" tab, select a channel from the drop-down menu of the Operating frequency > Channel drop-down. Also select between 20 MHz and 40 MHz in the **"Width"** drop-down. (Best practice: select a higher channel to avoid interfering with other networks)

Rapidus Sta	atus <del>-</del> Sys	stem - Network -	Logout		AUTO REFRESH ON
No password There is no passw Go to password o	vord set on th		figure a root password to	protect the web interface and	enable SSH.
The Device Configura	ation section works (if the	n covers physical sett		e such as channel, transmit po	wer or antenna selection which are shared among all r operation mode are grouped in the <i>Interface</i>
General Setup	Advanced	l Settings			
	Status	0% BSSID Chann Signal	Master   SSID: LEDE 04:F0:21:1D:7A:8C   E el: 36 (5.180 GHz)   Tx- 0 dBm   Noise: -105 dl 0.0 Mbit/s   Country: U	ower: 23 dBm	
Wireless network	is enabled	Disable	4		
Operating	frequency	Mode Channe AC T 36 (518	0 MHz)  40 MHz 20 MHz	<b>—</b>	
Trans	smit Power	23 dBm (199 mW)	40 MHz 80 MHz		

Create your own ESSID name that you will use for your AP. Be sure that the "Mode" is set to "Access Point" Click "Save & Apply" to save your settings

Rapidus Sta	atus <del>-</del> Sys	stem - Network - Logout Auto REFRESH ON
Interface Conf	figuratior	1
General Setup	Wireless S	Security MAC-Filter Advanced Settings
	ESSID	Sample-AP-5G
	Mode	Access Point
	Network	🖉 lan: 🖉 🦉 🙊
		mesh: (no interfaces attached)       create:
		2 Choose the network(s) you want to attach to this wireless interface or fill out the create field to define a new network.
H	lide ESSID	
W	VMM Mode	
	💽 Ba	ack to Overview Save & Apply Save Reset

You have now completed the process of creating your AP. If you find you are having issues or the process is not configuring correctly, please contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.



# **CLIENT (STATION)**

## **CONFIGURATION CLIENT HOW-TO**

#### **Configuring Client Access**

Here we will guide you through the process of configuring your device into a Client (station). Be aware that certain settings have to align with your AP configured device, so that communication between the two devices can function.

To get started login to your device and select "Wireless" from the drop-down "Network" tab.

Rapidus Status - System -	Network - Logout	AUTO REFRESH ON
	Interfaces	
No password set!	Wireless	
There is no password set on this route	DHCP and DNS	ssword to protect the web interface and enable SSH.
Go to password configuration	Hostnames	
	Static Routes	
Status	Firewall	
System	Diagnostics	
Hostname	Rapidus	
Model	Rapidus Wire	less RL Series
Firmware Version	RL r 2 r2292	/ LuCl Master (git-16.324.51057-1c27f6b)
Kernel Version	4.4.32	
Local Time	Tue Nov 22 0	9:52:43 2016
Uptime	0h 1m 55s	
Load Average	0.44, 0.27, 0	10
Memory		
Total Available	90188 kB	/ 125352 kB (71%)
Free	87620 kB	/ 125352 kB (69%)

From here you will select the radio for which you will be using for your Client (station). The radio you choose here will depend on which radio you have chosen to make as your AP. Be sure when choosing which radio to use for your Client (station) that it is on the same frequency as the radio you configured for your AP device. (ei. If your AP device is operating in 5.8GHz then your Client (station) must also operate in 5.8GHz)

Rapidu	S Status -	System -	Network -	Logout						AUTO REFRESH ON
There is	no password set! assword config		. Please confi	gure a root password to	protect the web interfa	ace and ena	ble SSH.			
Wirele	ess Ove	rview								
		(5.180 GHz)		02.11bgnac (radio0 ∜s	))				Scan	Add
		SSID: LEDE   BSSID: 04:F0		r   E <b>ncryption:</b> None			Disable		E·dit	Remove
		(2.462 GHz)   I							Scan	Add
	di 0%	SSID: LEDE   BSSID: 04:F0		er   Encryption: None		0	Disable		Edit	Remove
Assoc	ciated St	tations								
5	SID	MAC-Addres	s	Host	Signal / Noise		RX R	ate / TX	Rate	
No infor	mation availabl	9								



When you are directed to the following page you will need to select the same "Width" as so it matches the AP you will be trying to communicate with. (ei. If your AP "Width" is set to 40Ghz then your Client (station) "Width" must be set to 40GHz as well)

Rapidus Status	- System - Network - Logout	SH ON				
No password set There is no password Go to password cont	set on this router. Please configure a root password to protect the web interface and enable SSH.					
The Device Configuration	work: Master "LEDE" (wlan0) n section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared amor s (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the Interface ation	ng all				
General Setup A	dvanced Settings					
Status Mode: Master   SSID: LEDE 0% BSSID: 04:F0:21:1D:7A:8C   Encryption: None Channel: 36 (5.180 GHz)   Tx-Power: 23 dBm Signal: 0 dBm   Noise: -105 dBm Bitrate: 0.0 Mbit/s   Country: US						
Wireless network is e	nabled 🕲 Disable					
Operating freq	Mode         Channel         Width           quency         AC         ▼         36 (5180 MHz)         ▼         40 MHz         20 MHz					
Transmit	Power         23 dBm (199 mW)         40 MHz 80 MHz           Ø dBm         80 MHz					

Scroll down the page to the **"Interface Configuration"** section. Here you will type in the same **"ESSID"** name as you used for the AP that you want to connect to (ei. if your AP **"ESSID"** is Sample1 then your Client (station) **"ESSID"** must be Sample1). You must also change the **"Mode"** to **"Client (WDS)"** in the drop-down menu. Be sure to click **"Save & Apply"** before you leave this page. Note: ESSID is case sensitive.

Rapidus Sta	atus <del>-</del> Sys	stem - Network - Logout	UTO REFRESH ON
Trans	smit Power	23 dBm (199 mW) • dBm	
Interface Con	figuration	1	
General Setup	Wireless S	Security Advanced Settings	
	ESSID	Sample-AP-5G	
	Mode	Client (WDS)	
	BSSID		
	Network	<ul> <li>Ian: I I I I I I I I I I I I I I I I I I I</li></ul>	network.
	📄 Ba	Save & Apply Save	Reset
Powered by LuCI Ma	aster (git-16.32	24.51057-1c27f6b) / RL r 2 r2292	

You have now completed the step for setting up a Client (station). . If you find you are having issues or the process is not configuring correctly contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.



# **ROUTER**

## **CONFIGURATION FOR ROUTER HOW-TO**

The Rapidus Wireless RL-series model devices are factory set to default bridge AP. In this How-To manual we will go through the process of changing your device from a bridge AP into a Router. The following steps for configuring your product are for devices that are already in default mode or have been reset to default.

**NOTE:** Before you start you should have a plan outlined of which IP addresses you will be using in your network to be set for your router.

### **Setting Device to Router Mode**

To begin you must first navigate to "Interfaces" in the drop down menu under "Network".

Rapidus Status - System	· Network - HotSpot Logout	AUTO REFRESH ON
Status	Interfaces Wireless	
System	DHCP and DNS Hostnames	
Hostname	Static Routes	
Model	Firewall Diagnostics	
Firmware Version	RL-K r3-rc4 r3311+6-fb18c3c / LuCl branch (git-17.090.64489-eb806fb)	

Once directed to the following page you will need to create a new interface by clicking "Add new interface...".

Rapidus status∓ s	ystern = Network = HotSpot Logout		AUTO REFRESH ON
MESH LAN			
Interfaces			
Interface Overview			
Network	Status	Actions	
MESH		🖉 Connect 🎯 Stop 🛛 🖉 Ed	it 💌 Delete
mesh	Unsupported protocol type. Install protocol extensions		
LAN	Uptime: Oh 3m 38s	🧶 Connect 🥘 Stop 🛛 🖉 Ed	it 💌 Delete
ø≇ ( <u>22 22 ∞</u> ∞) br-lan	MAC-Address: F6:BB:87:BA:E1:E2 RX: 188.37 KB (1764 Pkts.) TX: 162.78 KB (767 Pkts.) IPv4: 192.168.1.99/24 IPv6: fd7a:744e:7630::1/60		
🞦 Add new interface			



You will first need to name your new interface (for our example we will name our interface **"wan**"). And select **"Custom Interface**" under the **"Cover the following interface**" options and type **"none**" in the available box. Click **"Submit**" once you're done.

Rapidus status= sy	xstem ≠ Network ≠ HotSpot Logout
Create Interface	wan
Note: interface name length	🥥 Maximum length of the name is 15 characters including the automatic protocol/bridge prefix (br., 8in4., pppoe- etc.)
Protocol of the new interface	Static address 🔻
Create a bridge over multiple interfaces	
Cover the following interface	<ul> <li>Ethernet Adapter: "eth0" (Ian)</li> <li>Ethernet Adapter: "eth1" (Ian)</li> <li>Ethernet Adapter: "teq10"</li> <li>Wireless Network: Master "LEDE" (Ian)</li> <li>Wireless Network: Master "LEDE" (Ian)</li> <li>Custom Interface I none</li> </ul>
	Back to Overview

Navigate back to "Firewall" in the drop down menu for "Network".

Rapidus Status – System –	Network = HotSpot	Logout	UNSAVED CHANGES 3 AUTO REFRESH ON
WAN MESH LAN			
Interfaces - WAN On this page you can configure the netwo network interfaces separated by space -	DHCP and DNS Hostnames Static Routes Firewall	ge several interfaces by ticking the "bridg in INTERFACE.VLANNR ( <u>e.g.</u> : etha.1).	e interfaces" field and enter the names of several
Common Configuration	Diagnostics s Physical Settings	Firewall Settings	



Scroll down the page to the "Zones" sections and click the "Edit" button for "wan".

Rapidus status – sys	tem ≠ N	etwork <del>v</del> Hot:	Spot Logout	t			UNSA/ED CHANGES: S
General Settings Port Fo	nvards	Traffic Rules	Custom R	iles			
Firewall - Zone S	_		ontrol network	traffic flow.			
General Settings							
Enable SYN-flood protection	•						
Drop invalid packets							
Input	accept						
Output	accept		Ŧ				
Forward	reject		٣				
Zones							
Zone ⇒ Forwardings		Input	Output	Forward	Masquerading	MSS clamping	
lan: lan: 🧾 🧾 🙊 🙊 ⇒	wan	accept 🔻	accept 🔻	accept 🔻			🛃 Edit 💌 Delete
wan: wan: 🛃 ⇒ (REJECT		reject 🔻	accept 🔻	reject 🔻	Ø	×	Z Edit Delete
1 Add							
						Save & Appl	y Save Reset



Under the "General Settings" tab change the settings for "input" to "accept" and also change the settings for "Forward" to "accept" as well. Scroll down the page, under "Inter-Zone Forwarding" select "Lan" for both "Allow forward to destination zones:" and "Allow forward from destination source zones:". Click "Save & Apply" once you have made these changes and before you move away from this page.

Rapidus <sub>Status</sub> <del>-</del>	System + Network + HotSpot Logout UNSA/EDICHAN
General Settings	Port Forwards Traffic Rules Custom Rules
Zone "wan" This section defines comm	<b>e Settings - Zone "wan"</b> on properties of "wan". The <i>input</i> and o <i>utput</i> options set the default policies for traffic entering and leaving this zone while the re policy for forwarded traffic between different networks within the zone. <i>Covered retworks</i> specifies which available networks are
	Advanced Settings
N	ame wan
I	nput accept 🔻
0.	accept 🔹
For	ward accept
Masquera	ding 🗹
MSS clam	ping 🗷
Covered net	vorks Ian:
	the forwarding policies between this zone (wan) and other zones. <i>Destination zon</i> es cover forwarded traffic originating from "wa rded traffic from other zonestargeted at "wan". The forwarding rule is <i>unidirectional</i> , e.g. a forward from lan to wan does <i>not</i> im
Allow forward to des <i>tina</i> 20	ition nes: 💹 Ian: 🚛 🖉 🧶 🙊
Allow forward from so zo	uree nes: Ian: 🔝 🖉 👳 👳
	Back to Overview Save Reset



Navigate back to the Interface page by clicking "Interfaces" in the drop down menu of "Network".

Rapidus Status System -	Network <del>–</del> HotSpot	Logout UN SAVED CHAING ES : 0
General Settings Port Forwards	Interfaces Wireless	om Rules
Firewall - Zone Settin	DHCP and DNS Hostnames	n"
Zone "Wan" This section defines common properties		tout options set the default policies for traffic entering and leaving this zone while the
<i>forward</i> option describes the policy for fo members of this zone.	Diagnostics	erent networks within the zone. Covered networks specifies which available networks are

When you arrive at the Interfaces page, under "Interfaces Overview" click "Edit" for the "WAN" interface to edit the network zone.

Rapidus status -	System – Network – HotSpot Logout		UNSAVED CHANGES: 3 AUTO REFRESH ON
WAN MESH LAN	L		
Interfaces			
Interface Overview			
Network	Status	Actions	
MESH Definition mesh	Unsupported protocol type. Install protocol extensions	🦉 Connect 🧕 Stop	Z Edit Delete
LAN () () br-lan	Uptime: 0h 20m 23s MAC-Address: F6:BB:87:BA:E1:E2 RX: 858.75 KB (7978 Pkts.) TX: 621.04 KB (3009 Pkts.) IPv4: 192.168.1.99/24 IPv6: fd7a:7.d4e:7630::1/60	🦉 Connect 🧕 Stop	Z Edit Delete
WAN	RX: 0 B (0 Pkts.) TX: 0 B (0 Pkts.)	🦉 Connect 🥥 Stop	🗾 Edit 🗴 Delete
Add new interface			



Under the "General Setup" tab for "Common Configuration" change the "Protocol" option to "Static Address" and click "Switch protocol".

Rapidus St	atus <del>-</del> System <del>-</del>	Network – HotSpot	Logout		AUTO REFRESH ON
WAN MESH	H LAN				
names of several ne	an configure the network twork interfaces separa		ge several interfaces by ticking also use <u>YLAN</u> notation INTER		
General Setup	figuration				
	Status	none	<b>RX</b> : 0 B (0 Pkts.) <b>TX</b> : 0 B (0 Pkts.)		
	Protocol Static a	ddress			
Really switc	:h protocol?	tch protocol			
	📄 Back to Ove	rview		Save & Apply Save	e Reset



Enter in the IP, netmask, gateway and DNS server addresses that you will be using to for your network. Click "**Save**" once done. (Refer to your IP address outlined plan for your required needs as to which IP addresses to use to connect back to your network)

Rapidus status	s≖ System≖ Ne	twork≖ HotSpot Lo;	gout	UNSAVED CHANGES: 4 AUTO REFRESH ON
	onfigure the network i		: several interfaces by ticking on INTERFACE.VLANNR ( <u>e.g.</u> : et	the "bridge interfaces" field and enter the names of several he.1).
Common Config	guration			
General Setup	Advanced Settings	Physical Settings	Firewall Settings	
	Status	none	R X: 0 B (0 Pkts.) T X: 0 B (0 Pkts.)	
F	Protocol Static ad	Iress 🔻		
IPv4	address 192.168.	23.54	)	
IPv4 r	netmask 255.255.3	:55.0 🔻	j –	
IPv4 ç	gateway 192.168.	23.1	J	
IPv4 br	roadcast			
Use custom DNS	S servers 192.168.	23.1	•	
IPv6 assignmen		•		
IPv6	address	a part of given length of	every public IPv6-prefix to th	is interface
IPν6 ç	gateway			
IPv6 route		prefix routed to this devic	e for distribution to clients.	
DHCP Server General Setup	IPv6 Settings nterface 🕑 🎯 Dis	able <u>DHCP</u> for this interfa	ce.	
	📄 Back to Overv	ew		Save & Apply Save Reset



Next click the "Physical Settings" tab under "Common Configuration".

Rapidus st	atus <del>-</del> System - Netw	ork∓ HotSpot La	ogout	
WAN MESH	LAN			
Interfaces	- WAN			
On this page you ca	n configure the network into		ge several interfaces by ticking tion INTERFACE.VLANNR (e.g.: ef	the "bridge interfaces" field and enter the names of several the.1).
Common Cor	figuration			
General Setup	Advanced Settings	Physical Settings	Firewall Settings	
	Status	Æ	RX:0 B (0 Pkts.)	
			RA: U D (U FKB.)	

In the "Physical Settings" tab, select "Bridge Interfaces" and for the "Interface" options select both "Ethernet Adapter: eth0 and eth1". Then <u>unselect</u> "Ethernet Adapter: none" and click "Save".

		work∓ HotSpot L	_ogout	UNSAVED CHANGES: 8 AUTO REFR
WAN MESH	LAN			
Interfaces -	WAN			
			ge several interfaces by ticking the "bridge interfa ation INTERFACE.VLANNR (e.g.: eth <b>9.1</b> ).	es" field and enter the names of sev
Common Config	guration			
General Setup	Advanced Settings	Physical Settings	Firewall Settings	
Bridge int	terfaces 💌 🛛 creat	tes a bridge over spec	ified interface(s)	
Enab	ole STP 🔲 😰 Enat	bles the Spanning Tre	e Protocol on this bridge	
Ir	nterface 📝 🔎 Ethe	ernet Adapter: "eth0" (	(lan)	
		ernet Adapter: "eth1" (		
		ernet Adapter: "none"	· ·	
	🔲 🖉 Eth	ernet Adapter: "teql0"		
	🔲 🙍 Wire	eless Network: Master"	'LEDE" (lan)	
	🗆   👳 Wire	eless Network: Master "	'LEDE" (lan)	
	🔲 🗾 Cust	tom Interface:		
DHCP Server				
General Setup	IPv6 Settings			
Ignore in	nterface 📝 👩 Disal	ble DHCP for this inter	fface	
-9		bie <u>bilon</u> for this fitter		
	📄 Back to Overvie			Save & Apply Save Res



At the top of the page click the "LAN" tab to edit the network zone for LAN.

Rapidus	Status 🔻	System =	Network 👻	HotSpot	Logout	UNSAVED CHANGES: 10 AUTO REFRESH ON
WAN M	ESH 🖸	AN				
Interfac						"bidge interfaced" field and onter the names of several

Edit the addresses under the "General Setup" tab. (Refer to your IP address outline plan for your required needs as to which IP addresses you will use for your networking)

Rapidus <sub>sta</sub>	tus 🕶 Sys	stern ≖ Network ≖ Ho	otSpot La	ogout	UNSAVED CHANGES: 10 AUTO REFRESH ON
WAN MESH	LAN				
Interference	1.0.1				
Interfaces		the network interfaces. Yo	u can bridg	e several interfaces by ticking th	ne "bridge interfaces" field and enter the names of several
				tion INTERFACE.VLANNR (e.g.: ethe	
Common Cont	figuratio	'n			
General Setup		d Settings Physical	Settings	Firewall Settings	
	Status	53	Uptime:	0h 39m 15s	
		br-lan		dress: F6:BB:87:BA:E1:E2 MB (14871 Pkts.)	
				MB (5639 Pkts.)	
				2.168.1.99/24 7a:7d4e:7630::1/80	
			11 90.10	a., d+e., 000 100	
	Protocol	Static address		,	
IPν	/4 address	10.0.0.1		J	
IPv	4 netm <i>as</i> k	255.255.255.0	v		
IPv4	4 gateway		_	5	
IPv4	broadcast				
Use custom Dt	NS servers			)	
IPv6 assignm∢	ent length	60	v		
		(2) Assign a part of give	en length of	f every public IPv6-prefix to this	interface
IPv6 assign	ment hint				
		🕘 Assign prefix parts u	sing this he	xadecimal subprefix ID for this i	nterface.
DHCP Server					



Unselect "Ignore interface" to enable DHCP. And click "Save".

General Setup Ad	vanced Settings IPv6 Settings
Ignore inter	rface Disable <u>DHCP</u> for this interface.
	Start 100 O Lowest leased address as offset from the network address.
I	Limit 150 Maximum number of leased addresses.
Lease	time 12h 2 Expiry time of leased addresses, minimum is 2 minutes (2m).

Scroll back up the page and click the "Physical Settings" tab.

Rapidus status <del>-</del>	System – Network – HotSpot L	ogout	UNSAVED CHANGES: 13 AUTO REFRESH ON
WAN MESH LAN	4		
Interfaces - LAI	N		
	re the network interfaces. You can bridg by spaces. You can also use <u>VLAN</u> nota	je several interfaces by ticking the "bridge interfac tion INTERFACE.VLANNR ( <u>e.g.</u> : eth <b>8.1</b> ).	es" field and enter the names of several
Common Configurat	tion		
General Setup Advar	nced Settings Physical Settings	Firewall Settings	



In the "**Physical Settings**" tab under the "**Interface**" options unselect both "**Ethernet Adapter: eth0 and eth1**". Once you have done so click "**Save & Apply**".

Rapidus status <del>-</del> sys	stem = Network = HotSpot Logout UNSAVEDCHARGES 38 AUTO REFRESHON
WAN MESH LAN	
	the network interfaces. You can bridge several interfaces by ticking the "bridge interfaces" field and enter the names of several spaces. You can also use <u>VLAN</u> notation INTERFACE.VLANNR (e.g., eth <b>8.1</b> ).
Common Configuratio	n
_	d Settings Physical Settings Firewall Settings
Bridge interfaces	🖉 👩 creates a bridge over specified interface(s)
Enable STP	Enables the Spanning Tree Protocol on this bridge
DHCP Server General Setup Advance	Ethernet Adapter: "eth0" (lan, wan)   Ethernet Adapter: "eth1" (lan, wan)   Ethernet Adapter: "teq10"   Ethernet Adapter: "teq10"   Wireless Network: Master "LEDE" (lan)   Wireless Network: Master "LEDE" (lan)   Ethernet Adapter: "teq10"   Custom Interface:
Ignore interface Start	<ul> <li>Disable <u>DHCP</u> for this interface.</li> <li>100</li> <li>Output the set of the</li></ul>
Limit	150 a Maximum number of leased addresses.
Leasetime	12h Expiry time of leased addresses, minimum is 2 minutes (2m).
B.	ack to Overview Save & Apply Save Reset



You will need to reboot your device for your changes to be taken into effect. Click "**Reboot**" from the drop down menu of the "**System**" tab at the top of the page.

Rapidus status <del>-</del>	System – Network – HotSpot L	ogout	AUTO REFRESH ON
WAN MESH L	System Administration		
Interfaces	Startup Scheduled Tasks		
Interface Overview	LED Configuration Maintenance		
Network	Reboot	Actions	

Your device is now configured to operate in router mode. If you find you are having issues or the process is not configuring correctly contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.



# <u>VLAN</u>

# **CONFIGURING VLAN HOW-TO**

A virtual LAN (VLAN) allows network administrators to group host together even if the hosts are not directly connected to the same network switch. This can greatly simplify network design and deployment. A VLAN could be used to separate traffic within a business due to users, and due to network administrators, or between types of traffic, so that users or low priority traffic cannot directly affect the rest of the network's functioning.

## **Configuring VLAN Settings**

To begin navigate to the VLAN configuration page by clicking the "Network" Tab and selecting the "VLANs" in the drop down menu.

Rapidus	Status <del>-</del>	System *	Network 👻	HotSpot	Logout
Ctatus			Interfaces		
Status			Wireless		
System			DHCP and	DNS	
System			Hostnames		
Hostname			Static Rout	es	
Model			VLANs		and BL K Series
Model			Firewall		ess RL K Series
Firmware Vers	ion		Diagnostics		-vlan-A107 r3311+36-fb18c3c / LuCl branch (git-
Manage Manager				4 4 47	



Once directed to the following page you will be able to configure your VALNs using the following sections. Configure **Management:** to restrict access to the current device to hosts on the configured VLAN ID, **WiFi Data:** to use the configured VLAN ID for Wi-Fi traffic and **Tiered WiFi access:** to use configured VLAN IDs for tiered access to your network from the WiFi interface.

#### **Management VLAN**

Under "**Management**" click the checkbox to enable the management VLAN, then enter the VLAN ID used for the management VLAN on your network. Optionally, you may edit the description box.

**Note:** When enabled, the internal changes in the unit are immediate, so the unit will subsequently only be accessible on the management VLAN. Be ready with a VLAN switch which handles the management VLAN ID. Plug the Ethernet cable from the unit into the trunk port, and your PC into the access port.

Then click **"Save & Apply"** to commit the configuration.

These tables speci	fy how this devic	æ's interfaces par	rticipate in	your network's	VLANs.				
Below are some pr Note: the WiFi Dat The descriptions a	a and Tiered Wif	Fi use cases are r	mutually e	xclusive and ca	n't both be enal				
Managemen		evice to hosts on f	the config	ured VLAN id.					
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wlan
management		99	trunk	trunk	trunk	trunk	trunk	trunk	trunk
WiFi Data	10 ANI 10 A. 197								
Description	Enabled	Fi traffic	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wlant
Description			eth0 trunk						
Description wifi-data Tiered WiFi a Use these configur For example, the d and "students".	Enabled	VLAN id	trunk your netwo	access	access	access	access	access	wlan1
Description wifi-data Tiered WiFi a Use these configur For example, the d	Enabled	VLAN id	trunk your netwo	access	access	access	access	access	acce
Description wifi-data Tiered WiFi a Use these configur For example, the d and "students". Note: the additions Description	Enabled	VLAN id	trunk your netwo d scheme r eth0	access	Fi interfaces. and "guests", or wlan1	sccess r a university 3-tie wlan0-1	access ared scheme mig wlan1-1	sccess	acce tors", "teac wlan
Description wifi-data Tiered WiFi a Use these configu For example, the d and "students". Note: the additiona	Enabled	VLAN id	trunk your netwo	access	Ei interfaces.	access	access	access	acce tors", "tea wlan
Description wifi-data Tiered WiFi a Use these configur For example, the d and "students". Note: the additions Description	Enabled	VLAN id	trunk your netwo d scheme r eth0	access	Fi interfaces. and "guests", or wlan1	sccess r a university 3-tie wlan0-1	access ared scheme mig wlan1-1	sccess	acce
Description wifi-data Tiered WiFi a Use these configur For example, the d and "students". Note: the additions Description wifi-tier1	Enabled  Enabled  CCCeSS  CCCCS  CCCCS  CCCCCS  CCCCCCC  CCCCCC	VLAN id	trunk your netwo d scheme r eth0 trunk	access ork from the Wii might be "staff" wlan0 access	Fi interfaces. and "guests", or wlan1	access r a university 3-tie wlan0-1 ignore	access ared scheme mig wlan1-1 ignore	access ac	lors", "tea wlan igno



#### WiFi Data VLAN

Click the checkbox to enable the Data VLAN and then enter the VLAN ID used for the data VLAN on your network. Optionally, you may edit the description box. Once you've done so click **"Save & Apply"** to commit the configuration.

Below are some pre		e's interfaces pa				spacial casar			
Note: the WiFi Data	a and Tiered Wi	Fi use cases are	mutually e	xclusive and ca	n't both be ena				
Management		evice to hosts on	the config	ured VLAN id.					
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wlan1-
management		99	trunk	trunk	trunk	trunk	trunk	trunk	trunk
WiFi Data									
Use the configured	VLAN id for Wi-	Fi traffic							
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wlan1-
		100	trunk	access	access	access	access	access	access
wifi-data Tiered WiFi a Use these configure For example, the di and "students".	ed VLAN ids for escriptions of a	tiered access to corporate 2-tiere	d scheme i			r a university 3-tie	ered scheme migl	ht be "administrat	ors", "teach
Tiered WiFi a Use these configur For example, the di and "students". Note: the additions	ed VLAN ids for escriptions of a I virtual APs mu	tiered access to corporate 2-tiere ist be set up first	d scheme I	might be "staff"	and "guests", o				
Tiered WiFi a Use these configure For example, the de and "students".	ed VLAN ids for escriptions of a	tiered access to corporate 2-tiere	d scheme i			r a university 3-tie wlan0-1	ered scheme migl wlan1-1	ht be "administrat wlan0-2	ors", "teach wlan1-:
Tiered WiFi a Use these configur For example, the di and "students". Note: the additions	ed VLAN ids for escriptions of a I virtual APs mu	tiered access to corporate 2-tiere ist be set up first	d scheme I	might be "staff"	and "guests", o				wlan1-
Tiered WiFi a Use these configur For example, the di and "students". Note: the additiona Description	ed VLAN ids for escriptions of a I virtual APs mu Enabled	tiered access to corporate 2-tiere ist be set up first VLAN id	eth0	wlan0	and "guests", o wlan1	wlan0-1	wlan1-1	wlan0-2	wlan1-
Tiered WiFi a Use these configur For example, the di and "students". Note: the additiona Description	ed VLAN ids for escriptions of a o I virtual APs mu Enabled	tiered access to corporate 2-tiere ist be set up first VLAN id	eth0	wlan0	and "guests", o wlan1 access	wlan0-1	wlan1-1	wlan0-2	wlan1-
Tiered WiFi a Use these configur For example, the di and "students". Note: the additiona Description wifi-tier1 wifi-tier2	ed VLAN ids for escriptions of a id l virtual APs mu Enabled	tiered access to corporate 2-tiere st be set up first VLAN id 100 200 300	eth0 trunk trunk	wlan0 access ignore	wlan1 access ignore	wlan0-1 ignore	wlan1-1 ignore access	wlan0-2	wlan1-3
Tiered WiFi a Use these configur For example, the di and "students". Note: the additions Description wifi-tier1 wifi-tier2 wifi-tier3 Advanced	ed VLAN ids for escriptions of a id l virtual APs mu Enabled	tiered access to corporate 2-tiere st be set up first VLAN id 100 200 300	eth0 trunk trunk	wlan0 access ignore	wlan1 access ignore	wlan0-1 ignore	wlan1-1 ignore access ignore	wlan0-2 ignore ignore access	wlan igno



#### Tiered WiFi access VLAN(s)

Up to 3 tiers can be configured in Tiered WiFi access. Each tier consists of 2G and 5G APs that can be configured on the Wireless page and a corresponding VLAN configured on the VLAN page. For the first tier, the default APs are used. For the second and 3<sup>rd</sup> tiers, additional 2G/5G APs are added to the 2G and 5G radios on the wireless page.

You will first need to configure the APs. Navigate to the Wireless configuration page by selecting the "**Network**" tab and clicking "**Wireless**" in the drop down menu.

Rapidus stat	tus 👻 System 👻	Network -	HotSpot	Logout
Status		Interfaces <b>Wireless</b>		
System		DHCP and Hostnames		
Hostname		Static Rout	les	
Model		VLANs Firewall		less RL K Serie
Firmware Version		Diagnostic	5	-vlan-A107 r33

Once directed to the following page. For each of the 2G and 5G default APs, navigate to editing the wireless setting by clicking **"Edit"** 

Filmen and F	Rapidus Status - System - Network - HotSpot Logout	AUTO REFRESH ON
	radio0: Master "Rapidus" radio1: Master "Rapidus"	
v	Nireless Overview	
	Qualcomm Atheros QCA9880 802.11nac (radio0) Channel: 149 (5.745 GHz)   Bitrate: ? Mbit/s	👩 Scan 🎦 Add
	SSID: Rapidus   Mode: Master BSSID: 04:F0:21:30:AF:94   Encryption: None	able Z Edit Remove
	Generic MAC80211 802.11bgn (radio1) Channel: 11 (2.462 GHz)   Bitrate: ? Mbit/s	Scan 👌 Add
	SSID: Rapidus   Mode: Master BSSID: 04:F0:21:1F:EC:20   Encryption: None	able 🗾 Edit 🔀 Remove



Note: The internal names of the APs are circled in Orange. They are the names shown on the VLAN page.

The default APs are named wlan0 and wlan1, the second tier APs will be named wlan0-1 and wlan1-1, and the 3<sup>rd</sup> wlan0-2 and wlan1-2.

Edit the radio and AP settings ae required. Be aware that the SSID can be the same for 2G and 5G APs in the same tier, but must be different for each tier. Make sure the checkbox for **"Separate Clients"** is **selected.** Click **"Save"** before you continue.

Rapidus Status - Sys	stem ▼ Network ▼ HotSpot Logout
radio0: Master "Rapidus"	radio1: Master "Rapidus"
The Device Configuration section	<b>k: Master ''Rapidus'' (Wlan0)</b> covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared among all radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the <i>Interface</i>
Device Configuration	
General Setup Advanced	Settings
Wireless network is enabled	Oisable
Operating frequency	Mode Channel Width AC  V 49 (5745 MHz)  V 40 MHz  V
Transmit Power	auto 🔻
Interface Configuration	
ESSID	Rapidus
Mode	Access Point T
Network	<ul> <li>Ian: J S @ @</li> <li>mesh: (no interfaces attached)</li> </ul>
	wan:
	create:
	Ohoose the network(s) you want to attach to this wireless interface or fill out the create field to define a new network.
Hide ESSID	
WMM Mode	×
Separate Clients	Prevents client-to-client communication
B	ack to Overview Save & Apply Save Reset



Then set the wireless security and click "Save & Apply" to commit the wireless settings.

Rapidus Status - System - Network - HotSpot Logout
radio0: Master "Rapidus" radio1: Master "Rapidus"
Wireless Network: Master "Rapidus" (wlan0) The Device Configuration section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the Interface Configuration.
Device Configuration
General Setup Advanced Settings
Wireless network is enabled
Mode     Channel     Width       Operating frequency     AC     V     149 (5745 MHz)     V
Transmit Power auto 🔻
Interface Configuration
General Setup     Wireless Security     MAC-Filter     Advanced Settings
Encryption
Back to Overview Save & Apply Save Reset



Navigate back to the wireless configuration page by selecting the "**Network**" tab and clicking "**Wireless**" in the drop down menu. For each of the  $2^{nd}$  and  $3^{rd}$  tier, and for each of the 2G and 5G radios, click "Add" to add another AP.

Rapidu	IS Status - System - Network - HotSpot Logout	AUTO REFRESH ON
radio0:	Master "Rapidus" radio1: Master "Rapidus"	
Wirel	ess Overview	
2	Qualcomm Atheros QCA9880 802.11nac (radio0) Channel: 149 (5.745 GHz)   Bitrate: ? Mbit/s	Scan 🚺 Add
	SSID: Rapidus   Mode: Master BSSID: 04:F0:21:30:AF:94   Encryption: None	Z Edit Remove
<b>@</b>	Generic MAC80211 802.11bgn (radio1) Channel: 11 (2.462 GHz)   Bitrate: ? Mbit/s	🖸 Scan 🎦 Add
	SSID: Rapidus   Mode: Master BSSID: 04:F0:21:1F:EC:20   Encryption: None	Z Edit Remove

**Note**: While adding and configuring the additional APs, a temporary name is used (circled in Orange). The APs will get the permanent names mentioned earlier (page 35).

Under the **"Interface Configuration"** section, in the **"General Setup"** tab, set the mode to **Access Point.** The page will change to the AP settings format, edit as required as described earlier for the first tier APs.

Rapidus Status - System - Network - HotSpot Logout	
radio0: Master "OpenWrt" radio0: Master "Rapidus" radio1: Master "Rapidus" radio0: Master "OpenWrt"	
Wireless Network: Master "OpenWrt" (radio0.network3) The Device Configuration section covers physical settings of the radio hardware such as channel, vanishint power or antenna selection which are shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the Interface Configuration.	
Device Configuration	
General Setup Advanced Settings	
Wireless network is enabled	
Mode     Channel     Width       Operating frequency     AC     V     149 (5745 MHz)     V	
Transmit Power auto 🔻	
dBm	
Interface Configuration	
General Setup Wireless Security Advanced Settings	
ESSID OpenWrt	
Mode Mobile Mesh 🔻	
BSSID Access Point Client	



When finished, the Wireless Overview page should appear like this.

F	Rapidus	S Status 🕶	System + Network +	HotSpot Logout				AUTO REFRESH ON
_	radio0: M	laster "tier2"	radio1: Master "tier2"	radio1: Master "tier1"	radio1: Master "tier3"	radio0: Master "	tier3" radio	0: Master "tier1"
v	Virele	ess Ove	rview					
	2		m Atheros QCA9880 8 19 (5.745 GHz)   Bitrate: ? M				G Scan	Add
		0%	SSID: tier1   Mode: Master BSSID: 04:F0:21:30:AF:94			Ø Disable	Z Edit	Remove
		0%	SSID: tier2   Mode: Master BSSID: 06:F0:21:30:AF:94			Ø Disable	Z Edit	Remove
		0%	SSID: tier3   Mode: Master BSSID: 02:F0:21:30:AF:94			Oisable	Z Edit	Remove
	<u>@</u>		IAC80211 802.11bgn ( (2.462 GHz)   Bitrate: ? Mt				G Scan	Add
		0%	SSID: tier1   Mode: Master BSSID: 04:F0:21:1F:EC:20			🙆 Disable	Z Edit	Remove
		0%	SSID: tier2   Mode: Master BSSID: 06:F0:21:1F:EC:20			Ø Disable	Z Edit	Remove
		0%	SSID: tier3   Mode: Master BSSID: 02:F0:21:1F:EC:20			🎯 Disable	Z Edit	Remove

The internal names of the APs can be verified by re-accessing the edit page for the AP.

Rapidus	Status - System - Network - HotSpot Logout
radio0: Mast	er "tier2" radio1: Master "tier2" radio1: Master "tier1" radio1: Master "tier3" radio0: Master "tier3" radio0: Master "tier3"
Wireless	s Network: Master "tier3" (wlan1-2)
	ofiguration section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared among all s networks (if the radio hardware is multi-SSID canable). Per network settinos like encryption or operation mode are grouped in the <i>Interface</i>



Navigate back to the VLAN page by clicking the "Network" Tab and selecting the "VLANs" in the drop down menu.

R	Rapidus	Status 🕶	System -	Network -	HotSpot	Logout
	radio0: Master	"tier2"	radio1: Mas	Interfaces Wireless		er "tier1"
v	Vireless	Overv	view	DHCP and DNS Hostnames		
	(@) QI	alcomm	Atheros 📢	VLANS		dio0)
	Ch Ch	annel: 149	(5.745 GHz)	Firewall		
		096	SID: tier1   I SSID: 04-E0-	Diagnostics		None

Click the checkbox to enable the **"WiFi Tiered access"** VLANs, then enter the VLANs used on your network for that tier. Optionally, edit the description box, then click **"Save & Apply"** to commit the configuration.

	ify how this devic	e's interfaces par	rticipate in	your network's	VLANs.				
Below are some p Note: the WiFi Da The descriptions a	ta and Tiered Wif	Fi use cases are r	mutually ex	xclusive and ca	n't both be ena				
Managemer		wice to bosts on t	the configu	red VLAN id					
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wla
management		99	trunk	trunk	trunk	trunk	trunk	trunk	tru
WiFi Data	d VLAN id for Wi-	Fi traffic							
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wla
wifi-data		100	trunk	access	access	access	access	access	ac
Note: the addition	al virtual APs mu:	at be set up first							
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	۷
wifi-tier1		100	trunk	access	access	ignore	ignore	ignore	ig
		200	trunk	ignore	ignore	access	access	ignore	
wifi-tier2									ig
wifi-tier2 wifi-tier3		300	trunk	ignore	ignore	ignore	ignore	access	
			trunk	ignore	ignore	ignore	ignore	access	iş
wifi-tier3			trunk eth0	ignore wlan0	ignore wlan1	ignore wlan0-1			
wifi-tier3 Advanced Use this to configu Description	are vians for new	use cases. VLAN id							

**Note:** This page uses the internals names (circled in Orange), to refer the APs.



Your device is now configured to operate in VLANs. If you find you are having issues or the process is not configuring correctly contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.

To reset, just the VLANs settings to the default of disabled, but keep all other settings intact. Uncheck all the enable boxes and then click **"Save & Apply".** 

Managemer Use this to restrict Description									
	access to this de								
	Enabled	VLAN id	the configue	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wlan
management	Ø	99	trunk	trunk	trunk	trunk	trunk	trunk	trun
WiFi Data	d VLAN id for Wi-	Fi traffic							
Description	Enabled	VLAN id	eth0	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	wlar
wifi-data		100	trunk	access	access	access	access	access	acc
Tiered WiFi Use these configu For example, the o and "students". Note: the addition	red VLAN ids for i descriptions of a c	corporate 2-tiered				a university 3-tie	red scheme mig	iht be "administrat	tors", "tes
Use these configu For example, the or and "students".	red VLAN ids for i descriptions of a c	corporate 2-tiered				a university 3-tie wlan0-1	ered scheme mig wlan1-1	ht be "administrat wlan0-2	tors", "tes wlan
Use these configu For example, the of and "students". Note: the addition	red VLAN ids for i descriptions of a c al virtual APs mus	corporate 2-tierec st be set up first	d scheme r	might be "staff" (	and "guests", or				
Use these configu For example, the of and "students". Note: the addition	red VLAN ids for i descriptions of a c al virtual APs mus	corporate 2-tierec st be set up first	d scheme r	might be "staff" (	and "guests", or				wlar
Use these configu For example, the <i>d</i> and "students". Note: the addition Description	red VLAN ids for i descriptions of a c al virtual APs mus Enabled	st be set up first VLAN id	d scheme r eth0	might be "staff" : wlan0	and "guests", or wlan1	wlan0-1	wlan1-1	wlan0-2	wlan
Use these configu For example, the ( and "students". Note: the addition Description	ered VLAN ids for 1 descriptions of a c al virtual APs mus Enabled	vLAN id	eth0 trunk	wlan0	wlan1	wlan0-1	wlan1-1	wlan0-2	
Use these configu For example, the cand "students". Note: the addition Description wifi-tier1 wifi-tier2	ered VLAN ids for 1 descriptions of a c al virtual APs mus Enabled	corporate 2-tiered st be set up first VLAN id 100 200 300	eth0 trunk trunk	wlan0 access ignore	wlan1 access ignore	wlan0-1 ignore	wlan1-1 ignore access	wlan0-2	wlar igno



Navigate to the **"System"** tab and click **"Reboot"** from the drop-down menu.

Rapidus Status -	System - Network -	HotSpot Logout
VLANS These tables specify how the	System Administration Startup	ate in your network's VLANs.
Below are some pre-configu Note: the WiFi Data and Tie The descriptions are for not	LED Configuration	cases, and an Advanced section for spec ually exclusive and can't both be enabled. used in VLAN operation
Management	Reboot	

When directed to the following page, click "Preform Reboot".

Rapidus	Status <del>×</del>	System +	Network 🔻	HotSpot	Logout	
Reboot						
Reboots the operating system of your device						
Perform reb	poot					

The unit will reboot with VLANs disabled, but all other settings will be reserved. If you find you are having issues or the process is not configuring correctly contact us by phone at 855-864-9488 or visit our website <u>www.rapiduswireless.com</u>.