Linksys E9450

WiFi 6 Dual-Band router

Training & Installation



Overview

- Product Features
- Physical Set Up
- Setting up via Linksys GUI (Recommended)
 - Set up mode for ONT (Singtel Profile) as RG
 - Set up mode for ONR (Bridge Mode) as Bridge
 - Set up mode for ONR with Bridge Mode (Manual)
 - Manual Set up
- Adding additional nodes of E9450 (Mesh Parent mode)
- Adding additional nodes of E9450 (Mesh mode)
- Set as standalone mode (Non-mesh system)
- Parental Controls
- Factory Reset Router
- Management Tab (Access Control > Passwords)
- Router Light Behaviour

For support: <u>https://www.linksys.com/sg/support-article?articleNum=317469#wireless2</u> https://www.linksys.com/sg/support-product?pid=01t2T000004rSMRQA2

Product Features

- Dual-Band AX5400 at up to 5.4 Gbps
- 802.11ax Wireless Technology
- 1.5 GHz Tri-Core processor
- 2x2 + 4x4 Spatial streams (6 streams)
- MU-MIMO technology
- Wi-Fi coverage of up to 2,500 sq ft
- Supports parent and child node
- Four gigabit ethernet ports and one gigabit internet port
- Parental Controls
- Wi-Fi Protected Setup[™] (WPS)
- WPA2[™] wireless security



- Buttons and Switch
 - Wi-Fi Protected Setup (WPS) button
 - Power switch
 - Reset button
- <u>Ports</u>
 - Power port
 - Four gigabit ethernet ports
 - One gigabit internet port
 - One USB 3.0 port (for future use)
- <u>Power</u>
 - Output: 12v, 2A



Physical Set Up (Without STB)

- Recommended to connect RG's Ethernet port to PC via LAN cable (wired).
- Else setup wireless using default routers name, "LinksysXXXX-guest" with the passphrase printed on the sticker label is required.
- Without STB, connect FTP to either ONR/ONT then to Linksys.



Physical Set Up (With STB)









- 1. Launch a web browser and enter Router's GUI http://192.168.79.1
- 2. Enter default Username and Password
 - Username: admin
 - Password: admin
- 3. 'Apply'
- 4. Set up E9450, Click 'Next'



- 5. Create new router Password
 - Include at least 10 characters in length.
 - Include at least 1 uppercase letter.
 - Include at least 1 lowercase letter.
 - Include at least 1 number.
 - Include at least 1 special character.
- 6. 'Next'

Create a router password

For your security, we ask you to change the default router password before continuing. You will use the password when you want to view or change router settings.

Password

••			show
/	Include at least 10 characters in length		
/	Include at least 1 upper case letter		
/	Include at least 1 lower case letter		
/	Include at least 1 number		
nc	lude at least 1 special character		
		Cancel	Next



7. Follow the Setup Wizard to change the default administration password, set up a parent node (unless adding a child node to an existing Wi-Fi system), select a transmit region and Name your Wi-Fi.

* Only Linksys E9450 child nodes are supported.



Cancel

Next

Choose the region where you will use the router to avoid fines and penalties.

< Name your Wi-Fi Youll use this name and password to connect devices to your Wi-Fi. Wi-Fi Name E9450 Wi-Fi Password E9450 secretpassword

8. Follow the Setup Wizard





- 9. Choose if you want to set up another node.
 - If 'No I'm done' go to step 11.
 - If 'Yes' continue to next slide.



10. Click 'Its Solid Blue' and follow the instructions.





11. Connect node to modem and 'Check for latest firmware'





12. Double check Auto Firmware Upgrade Feature. ('Check Firmware')

• Auto Firmware Upgrade Feature will always keep your device fresh with the latest update. Be it security patches, features, performance improvements, bug fixes, etc.

LINKSYS	5					Logout Firmware Version: 1.0.00.042 Wi-Fi Router E9450
Device Info	General	Wireless	Advanced Setup	Diagnostics	Management	
► Settings		Firmware Upgrade				
 Internet Time Access Control Firmware Upgrade 		 Automatic Firmware Upgrade Check Firmware 	(Current	t firmware version:1.0.00.042)		
Firmware Upgrade ► Reboot		Please select a file to upgrade	Browse	. No file selected.		
▶ Language		Warning: Upgrading firm	Sta ware may take a fe	ew minutes; please dor	n't turn off the pow	ver or press the reset button.
				0%		
		Upgrade must NOT be in	terrupted!!			



You finished setting up your node, but you are not connected to the internet. Please check with your internet provider. When you do get online, remember to connect your devices.



By default, the router runs in DHCP WAN mode without VLAN tag. This page may appear when E9450 is installed with Singtel ONT that requires VLAN tag

Click "Go to the Internet settings" to continue the setup

Set up via Linksys GUI

 To allow full Singtel Home Broadband experience, the E9450 can be configured as Residential Gateway (RG) or Bridge Mode (AP) depending of the Modem Configuration – See the following pages for different configuration with different modem constructs.



Set up mode for ONT (Optical Network Terminal)

• If you are using a **Singtel ONT**, disconnect and remove your old router.



Set up mode for ONT (Singtel Profile) as RG

LINKSYS															Firmw Wi-F	are Version: 1.0.00.042 Router E9450
Device Info	General		Wireless		Advanced	Setup		Diagno	stics		Managen	ient				
✓ Internet Setup Internet Setup Mesh Setup		Wide An Select Profile Choose Add,	rea Netwo	ork (V	VAN) Se Manual ✓ Singtel Bridge mo	rvice ode	Setup A	pply erface.								
		Interface	Description	Туре	Vlan8021p	Vlan Mux Id	VlanTpid	Igmp Proxy	Igmp Source	NAT	Firewall	IPv6	Mid Proxy	Mid Source	Remove	Edit
		Wan.1	cpe-ipintf-2	IPoE	0	10	0x0	Disabled	Disabled	Enabled	Enabled	Disabled	Disabled	Disabled		Edit
		Wan.2	cpe-ipintf-3	IPoE	4	20	0x0	Enabled	Enabled	Enabled	Enabled	Disabled	Disabled	Disabled		Edit
		Add		Remo	ove											

"Singtel" Profile will have DHCP Option 60, IGMP Proxy, DNS Forwarding, Static Router for Multicast STB and support the MioTV STB to work. It also incorporated the multi VLAN on WAN Interface.

Set up mode for ONR (Bridge Mode) as Bridge

• If you are using a **Singtel ONR/ONR with bridge mode**, disconnect and remove your old router/access point.



Set up mode for ONR (Bridge Mode) as Bridge

LINKSYS															Firmwa Wi-Fi	Router E94	42 50
Device Info	General		Wireless		Advanced	Setup		Diagnos	stics		Managemo	ent					
▼ Internet Setup		Wide Ar	ea Netwo	ork (M	/AN) Ser	rvice	Setup										
Internet Setup Mesh Setup		Select Profile		C	Bridge mode	e	Aj	pply									
		Choose Add, I	Remove or Edit	to configu	re a WAN servi	ce over a	a selected inte	erface.									
		Interface	Description	Туре	Vlan8021p	Vlan Mux Id	VlanTpid	Igmp Proxy	Igmp Source	NAT	Firewall	IPv6	Mid Proxy	Mid Source	Remove	Edit	
		Wan.1	cpe-ipintf-4	Bridge	N/A	N/A	N/A	Disabled	Enabled	Disabled	Disabled	Disabled	Disabled	Enabled		Edit	
		Add		Remo	ve												

"Bridge mode" Profile will function as Wireless Access Points to the Singtel ONR, this mode will allow the MioTV STB to work behind E9450. DHCP Option 60 Passthrough from STB to ONR for the Multicast Streaming feature.

When applying bridge mode, the router will reboot. You will lose the connection to the E9450. To re-access E9450 GUI, you may want to check its IP address from ONR's DHCP list.

LINKSYS														Fir Wi	mware Versio -Fi Rou	n: 1.0.00.04 ter E945
Device Info	General	ţ	Wireless		Advanced	Setup	Dia	agnostics		Manag	jement					
 Internet Setup Internet Setup Mesh Setup 		Wide An Select Profile Choose Add,	rea Netwo	D rk (V	VAN) Se Manual Singtel Bridge me ure a WAN serv	rvice Se	etup Apply									
		Interface	Description	Туре	Vlan8021p	Vlan Mux Id	VlanTpid	Igmp Proxy	Igmp Source	NAT	Firewall	IPv6	Mid Proxy	Mid Source	Remove	Edit
		Add		Rem	ove											

From factory default mode, follow setup wizard. (recommended to avoid any misconfiguration)

WAN Service Configuration	No need to	WAN IP Settings
Select WAN service type:	change any setting in	Enter information provided to you by your ISP to configure the WAN IP settings. Notice: If 'Obtain an IP address automatically' is chosen, DHCP will be enabled for PVC in IPoE mode. If 'Use the following Static IP address' is chosen, enter the WAN IP address, subnet mask and interface gateway.
O PPP over Ethernet (PPPoE)	this page.	Obtain an IP address automatically
IP over Ethernet	Click Next	Option 60 Vendor ID:
		Option 61 IAID: (8 hexadecimal digits)
		Option 61 DUID: (hexadecimal digit)
		Option 77 User ID:
		Option 125: Disable Enable
Enter Service Description		
		Option 50 Request IP Address:
For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.		Option 51 Request Leased Time: 0
For untagged service, set -1 to both 802.1P Priority and 802.1Q		Option 54 Request Server Address:
VLAN ID.		
Enter 802.1P Priority [0-7]:		
Enter 802.1Q VLAN ID [0-4094]:		 Use the following Static IP address:
Select VLAN TPID: Select a TPID		WAN IP address:
		WAN Subnet Mask:
Internet Protocol Selection		WAN gateway IP Address:
IPV4 Only 🗘		New Back
		Back
Next Back		

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).	Routing Default Gateway Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first b
Enable NAT	Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first b
Enable Fullcone NAT Make sure Enable NAT and Enable Firewall is checked.	Iast one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again. Selected Default Gateway Available Routed WAN Interfaces Interfaces Wan.1 Image: Content of the second
default. Click Next	
IGMP Multicast	
Enable IGMP Multicast Proxy	
Enable IGMP Multicast Source	
Next Back	Next Back

protocol is ina the hia

DNS Server Configuration	
Select DNS Server Interface from available WAN int server IP addresses must be entered. DNS Server Interfaces can have multiple WAN inter lowest priority if the WAN interface is connected. Pr	ierfaces OR enter static DNS server IP addresses for the system. If only a single WAN with static IPoE faces served as system dns servers but only one will be used according to the priority with the first br riority order can be changed by removing all and adding them back in again.
• Select DNS Server Interface	from available WAN interfaces:
Selected DNS Server Interfaces	Available WAN Interfaces
Wan.1	
Use the following Static DNS	IP address
Primary DNS server	
Secondary DNS server	
Default DNS fr available WA Interface shoul	rom N d be
WAN. I. CIICK I	NEXL
Next Back	

Make sure that the settings below match the settings provided by your ISP.

Connection -Type	IPoE
NAT	Enabled
Full Cone NAT	Disabled
Firewall	Enabled
IGMP Multicast Proxy	Disabled
IGMP Multicast Source Enabled	Disabled
MLD Multicast Proxy	Disabled
MLD Multicast Source Enabled	Disabled
Quality Of Service	Disabled

Click 'Apply/Save' to have this interface to be effective. Click 'Back' to make any modifications.

Apply/Save

This shows the configuration summary. Click Apply/Save. If needed, please reboot the router to ensure configuration is applied properly.

• Create a new **SSID** (Wi-Fi name) and **Passphrase** (Wi-Fi Password). Click **Apply/Save** once done.

		Mesh Setup	
General	> Mesh Setup	Choose the node type:	Parent Node
Mesh Setup		choose the node type.	Parent Node
		SSID:	WIFIHOME
Choose the node type:	Child Node	Authentication Type:	WPA2-PSK \$
Apply/Save	Child Node Non-Mesh System	Encryption Type:	AES ‡
		Passphrase:	WIFIPASSWORD
		Apply/Save	

Manual Set Up

OBSS Coexistence

 Click on Wireless > Radio. Select your Country from the drop-down menu, then scroll down and click Apply.

Asia - Vietnam

Radio				
This page allows you to configure the Phy	sical WiFi interfaces.			
Wireless Interface	5 GHz 💲			
Country	Asia - Singapore Current SG			
Interface	Asia - China Asia - Rest of Asia	Wide Area Net	work (WAN) Service Se	tup
802.11 Band	Asia - Hong Kong Asia - India Iz Asia - Korea	Select Profile	Singtel 🗸	Apply
Channel Specification	Asia - Macau Asia - Malaysia *Interference Level: Acceptable			
Bandwidth	Asia - Philippines Asia - Singapore Asia - Thailand			
	Asia - Taiwan			

Go to General > Internet Setup

click **Apply** to save settings

• Select the preconfigured profile of **Singtel** and

Manual Set Up

• Now **reboot the modem** and wait until the INTERNET indicator light on the front panel of the router turns solid blue.

d Profile			Manual	*	A	ipły								
n Add, I	ietrove or Edit to	untgan	a WAR pervise o	veraadi	cted interface									
vterface	Description	Type	Vian8021p	Vian Mux Id	VlanTpid	Igmp Proxy	Igmp Source	NAT	Firewall	IPv6	Hid Proxy	Hid Source	Remove	Edit
t.reW	cpe-pixt-2	(PoE	34/A	N/A	N/A	Cisabled	Deabled	Enabled	Enabled	Deabled	Disabled	Disabled	0	Edit

Take note:

Before you begin, take note of the following:

- Only Linksys E9450 child nodes are supported.
- Linksys Velop or Mesh Routers are not supported.
- If you are adding another Linksys E9450 that has been configured with settings, make sure to reset it to factory settings first.
- The Linksys E9450 connected to the modem is called the **parent node**. Other Linksys E9450 routers that you will use to extend the Wi-Fi are called **child nodes**.
- The external WPS button is located at the Linksys E9450's back panel. It is the first button at the top

There are two ways to add E9450 Child Node into a Parent E9450

- Through Setup Wizard See slide 6 video
- From GUI General > Internet Setup > Mesh Setup > Add a new node

LINKSYS						Logout Firmware Version: 1.0.00.042 Wi-Fi Router E9450
Device Info	General	Wireless	Advanced Setup	Diagnostics	Management	
✓ Internet Setup		Mesh Setup				
Mesh Setup		Chose the node type:	Parent Node	¢		
		SSID:	E9450			
		Authentication Type:	WPA2-PSK	\$		
		Encryption Type:	AES	\$		
		Passphrase:	12345678			
		Apply/Save				
		Mesh parent mode state:	Status:		Enable	
		Connected child node information:				
		Name	MAC		RSSI	
		Add a new node				



Wait for child node to power up properly, Press "It's Solid Blue" to continue Once the Child Node power up completely, press "Done"



The countdown has started

Monitor the MESH LED of both Parent and Child Node. At this time, it should be blinking blue rapidly.

• Once pairing is complete the MESH indicator light will turn solid blue and the connected child node will now appear on the table of connected child nodes.

Mesh parent mode state:	Status:	Enab	Enable		
onnected child node information:					
Name	HAC	RSSI			
c4:41:1e:a0:99:49	o4:41:1e:a0:92:49	-110	Update		

 To rename the child node, simply enter your preferred Name in the field then click Update once done.

lame	MAC	RSSI		
Living room	c4;41:14:a0:99:49	-110	Update	

• Child Node information should be added into Mesh Setup Page.



N.B. With current shipping firmware, it only allow to add up to 2 child nodes in one system. To add more nodes will be for future update. Please ensure the firmware upgrade feature is enabled to received the most updated firmware.

Set as standalone mode (Non-mesh system)

LINKSYS						Firmware Version: 1.0.00.042 Wi-Fi Router E9450
Device Info	General	Wireless	Advanced Setup	Diagnostics	Management	
✓ Internet Setup		Mesh Setup				
Internet Setup			Parent Node Child Node			
Mesh Setup		Chose the node type:	v Non-Mesh Sys	stem		
		SSID:	E9450			
		Authentication Type:	WPA2-PSK	÷		
		Encryption Type:	AES	\$		
		Passphrase:	12345678			
		Apply/Save				

In this Mode, the E9450 will disable the Mesh functionality and work as a standalone/traditional router. In this Mode, the SSID format will be change accordingly:

- 2.4GHz == XXXXXX
- 5GHz == XXXXXX_5G

When "**XXXXXX**" is the SSID name on the SSID input box

Parental Controls (Access Time Restriction)

- 1. Log into parent node.
- 2. Advanced setup > Parental Control
- 3. Under the Access Time Restriction section, click Add button.

 A maximum 16 entries can be configured

 Username
 MAC Address

 Add
 Remove

4. Enter a user name for the client

Username



Parental Controls (Access Time Restriction)

5. Select the **Other MAC Address** radio button and enter the client's MAC address.

0	Browser's MAC Address	c4:41:1e:fe:d9:82
(\bullet)	Other MAC Address	
(xx:x	x:xx:xx:xx)	E0:B5:5F:C7:53:55

NOTE: The **Browser's MAC Address** automatically displays the MAC address of the LAN device where the browser is running.

6. Choose the days you want to restrict the client from accessing the network

Days of the week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	~	~	~	~			

Parental Controls (Access Time Restriction)

7. Enter the start and end blocking times.



8. Click Apply/Save.

Access Time Restriction

A maximum 16 entries can be configured

Username	MAC A	Address	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start	Stop	Remove
User1	E0:85:	SF:C7:53:55	×	×	×	x				18:0	21:0	
Add		Rer	nove									

Note: To delete a client from parental controls, just check the **Remove box** and click the **Remove** button.

Parental Controls (URL Filter)

- 1. Log into parent node.
- 2. Advanced setup > Parental Control
- 3. Under the URL Filter section, select Exclude and click Add button.

URL Filter

Please select the list type first then configure the list entries. A maximum 100 entries can be configured



Parental Controls (URL Filter)

4. Enter a URL Address and click **Apply/Save**

URL Filter

Enter the URL address and port number then click 'Apply/Save' to add the entry to the URL filter.

URL Address	www.websitexyz.com		
Port Number		(Default 80 will be applie	ed if leave blank.)
Apply/Sa	ive		

A URL address will be displayed in the table.



Management Tab (Factory Reset Router)

If you encounter any issue, you can always start fresh by factory reset the router. Please note that all the existing configuration will be wiped out, make sure you backup any configuration if needed.

							put	
LINKSYS						Wi-Fi Router E94	50	
Device Info	General	Wireless	Advanced Setup	Diagnostics	Management			
✓ Settings		Tools Restore De	fault Settings				WPS O	
Backup Update		Restore Broadband Router settings	s to the factory defaults.				-	
Restore Default Internet Time 		Restore Default Sett	ings				2 Ebernet 3	
 Access Control 							· -	
 Firmware Upgrade Reboot 							neme	
▶ Language								
					Press t at	he Reset Button least 5 seconds	Re. ▲	

Management Tab (Access Control > Passwords)

• Make sure to use 'admin' as user name.

Settings Access Control -- Passwords Internet Time Access to your broadband router is controlled through three user accounts: superuser, support, and admin. Access Control Superuser has unrestricted access to change and view configuration of your Broadband Router Passwords. 'Support' is used to allow an ISP technician to access your Broadband Router for maintenance and to run diagnostics. Firmware Upgrade 'Admin' can access the Broadband Router, view configuration settings and statistics, as well as, update the router's software Use the fields below to enter up to 16 characters and click 'Apply/Save' to change or create passwords. Note: Password cann-Reboot Language User Name Old Password New Password Confirm Password Apply/Save

Light	Activity	Description
	Solid Blue	System is up and ready
Power	Blinking Blue	Router is starting up
	Solid Orange	Boot loader is up or error
Wi-Fi	Solid Blue	Wi-Fi is ready
Internet	Solid Blue	Connected to the internet
	Solid Orange	Not connected to the internet
Ethernet	Solid Green	Client connected to a port
Light	Blinking	Internet activity
(back panel)	Green	
Mesh	OFF	No connection from a child node
(parent	Solid Blue	Connected to a child node
node)	Blinking Blue	Pairing with a child node
	Blinking	Pairing failed with a child node
	Orange	
Mesh	OFF	Not connected to a mesh network
(child node)	Solid Blue	Connected to a mesh network
	Blinking Blue	Pairing in progress with a parent node
	Blinking Orange	Disconnected from a parent node

