

How to Configure and Activate a Virtual Router Instance with Hardware, Virtual, VLAN, or Bundled Interfaces

https://campus.barracuda.com/doc/22726/

Virtual routers forward traffic like physical routers. Because they are virtual, these routers can be configured and activated on demand without the need of using a separate hardware device. Each virtual router uses its own routing and forwarding table. The routing and forwarding table describes the path between multiple interfaces that packets travel through.

The following example demonstrates how to connect a private network (e.g., a classroom) that gets access to the Internet via a virtual router. The private network will be connected on interface eth2, the Internet to the interface eth3. In this setup, the firewall service will be transparent to the additional virtual router instance only if authenticated users are not defined. All other services are not available to the additional virtual router. For more information on which services are available for additional virtual instances, see <u>Virtual Routing and Forwarding (VRF)</u>.



Step 1. Create a Virtual Router Node



- 1. Go to **CONFIGURATION > Configuration Tree > Box**.
- 2. Right-click **Network**.
- 3. From the menu, select **Lock**.
- 4. (optional) In case the firewall is a CC-managed appliance:
 - 1. The window for **Emergency Override** is displayed.
 - 2. Click **OK** if you want to override the configuration provided by the Control Center.
- 5. From the menu, select Create Virtual Router Instance.
- 6. The window for naming the virtual router is displayed.
- 7. Enter the name for the virtual router, e.g., VR01.
- 8. Click **OK**.
- 9. In the ribbon bar, click **Activate**.
- 10. The Activate Changes window opens.
- 11. Click Activate.
- 12. The virtual router node is displayed one hierarchy level below **Network**.



Step 2. Create the Virtual Router and Assign Required Interfaces (Hardware, Virtual, VLAN, and Bundled Interfaces)

Before the creation of a virtual router, all interfaces are assigned to the 'default' router.



- 1. Go to **CONFIGURATION > Configuration Tree > Box > Network**.
- 2. In the left menu, select **Virtual Router**.
- 3. Click Lock.
- 4. In the list, double-click the entry with the interface that you want to assign to the virtual router



node, e.g., eth2 to VR01.

- 5. The Virtual Router Interface Assignment window is displayed.
- 6. From Virtual Router Name, select your virtual router, e.g., VR01.

Interface Assignment			
VR Instance	VR01 ~	۰.	
Interface Type	Ethemet	•	

7. Click **OK**.

- 8. (optional) In case you want to assign further interfaces, repeat the previous four steps.
- 9. Click Send Changes.
- 10. Click **Activate**.

Virtual Routing and Forwarding				
Virtual Router Interface Assignment			• 🗙 🔊 📄 🐔	Ē,
	Name	Virtual Router Name	Description	
	eth0	default	Ethemet interface	
	eth1	default	Ethernet interface	
	eth2	VR01	Ethernet interface	
	eth3	VR01	Ethernet interface	
	<		>	
				1

Step 3. Activate the New Network Configuration

After assigning interfaces to the virtual router, the network must be re-activated with the new interface assignment.

- 1. Go to **CONTROL > Box**.
- 2. In the left menu, click **Network** to expand the menu.
- 3. Click Activate new network configuration.
- 4. The Network Activation window is displayed.
- 5. Click Failsafe.

Step 4. Configure Network/IP Addresses

The new virtual router needs to know which IP address(es) is/are assigned to which interface(s) and define the network path, e.g., the path from the classroom to the Internet.

1. Go to **CONFIGURATION > Configuration Tree > Box**.

- 2. In case your virtual router node is not displayed, click the + to the left of the node **Network**.
- 3. Double-click VR Instance [your virtual router].
- 4. The newly created VR instance is displayed showing the state and the ID of the instance.

Barracuda CloudGen Firewall



	DASHBOARD CONFIGUR	ATION CONTROL FIREW	ALL ATP VPN	DHCP LOGS	STATISTICS	EVENTS	SSH		Ç
	Configuration Ne Tree Ve	twork VRF × (F-eth2)			State Info	Activ	ate 🕤 Undo	Not Disconnect	t
	Network VRF [VRF-eth	2]				Discard Im/Export	Lock	Send Changes	×
	 Configuration General IP Configuration Routing Configuration Mode 	VR Instance Configuratio	n yes 2				Enable VR Ins Use this setting to VR Instance. If set and assigned inte down. VR Instance II The ID of the VR Ir number between Attention: If you change th you have to mai firewall rules re instance.	enable or disable the or ho' its IP addresse fraces will be set to D Instance needs to be a 1 and 255. The VR Instance ID, nually adapt all oferencing this VR	s
	Do not chang If you must c instance and For more info	ge the VR Insta hange the ID of then create a r ormation, see He	nce ID after an active vin ew virtual in ow to Delete	clicking S rtual route stance! a Virtual F	end Ch r, you m Router Ir	anges Just firs	and Act	ivate ! the active article.	
5.	Click Lock .	· _							
6.	From the left me	enu, select IP C	onfiguratio	n.					
7.	In the IPv4 Add	Iresses section	, click +.						
8.	The IPv4 Addre	esses window o	pens.					_	_
9.	Enter the name	for the IP addre	ss, e.g., VR0	1-to-Class	room1.	The IP	Address	Configur	ration
	window opens.								
	 Interface 	e Name – Select	the interfac	e that will	be man	aged b	y the virt	ual router,	, e.g.,
	etn∠. ∘ IP Addre	ss - Enter the If	o address that	at must be	assigne	d to th	e interfac	e, e.g.,	
	192.168	.0.1							
	• Associate	ed Netmask - S	Select the siz	ze of the n	etmask	from th	ie list, e.g	J., 24-bit .	
	 Respond packets. 	s to Ping - Sele	ect yes in ca	se you wa	nt the in	terface	e to respo	nd to ICM	P ping
10.	Click OK .								
11.	Repeat all steps e.g., VR01-to-IN	beginning with TERNET. eth3. 6	Step 7 for th 52.99.0.29.	ne IP addre	ess that	will be	connecte	d to the Ir	nternet,

12. Click Send Changes.

13. Click **Activate**.

Configure IP Addresses									
Pv4 Addresses			P	¢	×	at	þ		ī,
	Name	Interface Nar	me			IP A	ddres	s	
	VR01-to-Classroom1	eth2				192	168.0	.254	
	VR01-to-INTERNET	eth3				62.9	9.0.2	9	

Step 5. Configure the Routing Table

Configure all routes according to your needs. In this example, a default route is added to the routing table of VR01.



1. Go to CONFIGURATION > Configuration Tree > Box > Network > VR Instance [your virtual router].

- 2. In the left menu, click **Routing**.
- 3. Click Lock.
- 4. In the **IPv4 Routing Table** section, click +.
- 5. The IPv4 Routing Table window is displayed.
- 6. Enter the name for the new routing table entry, e.g., VR01-to-INTERNET. The window for the **Route Configuration** is displayed.
 - Target Network Address Enter the IP address of the destination network, e.g.
 0.0.0.0/0
 - Route Type Select gateway.
 - Gateway Enter the IP address to the gateway, e.g., 62.99.0.254
- 7. Click **OK**.
- 8. Click Send Changes and Activate.

IP∨4 Route Configuration —			Target Network Address	
Target Network Address	0.0.0/0	Ē	Enter the IP address of the destination network. Example: Default route:	Í
Route Type	gateway	✓ Ē	v 0.0.0.0/0	
Interface Name	eth2	🖉 Other 🗐	Route Type Select the type of the network route	
Gateway	1.1.1.254	Ē	directly attached network Device route to a network	
Route Metric	1	Ē	 directly connected to the firewall. gateway 	
Default Gateway		Ē	 Gateway route to a network connected via a next hop device. 	
MTU	1500	Ē	 multipath Multipath petwork route 	
Reachable IPs		+ × + +		
			Note: You must switch to Advanced View to configure multipath routes.	

Step 6. Verify the New Network Configuration

1. Go to **CONTROL > Network**.

2. In the left column, select **default** to display the network settings for the default router.



TTT INCOM	Interfaces/IPs	IPs Interfaces	Proxy A	ARPs ARPs St	atistics OS	PE RIP BG	P 9	witch Info IPv	6 ND Cache
OVR01	Interface/IP	in a intendees	La	bel Pino	MAC of	duplicate IP		Info	o ND Cacilo
default									
		127.0.0.1/8	lo	op ok	-				
		127.0.0.9/32	S	1 ok	-				
	📄 👗 et	th0, Speed=10000)Mb/s, I	Duplex=Full					
		10.17.94.120/24	mi	ip0 ok	-				
	📄 🚠 et	th1, Speed=10000)Mb/s, I	Duplex=Full					
		62.99.0.28/32	S	1 ok	-				
		h4							
	0 👬 et	h5							
	TABLES	ALL		\sim					
	Table / Src Filt	er	State	Type	Interface	Src IP	Pref	Gateway	Name
		main, From all	0.010	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				distoring)	
		.17.4.0/24	up	gateway-boot	eth0	10.17.94.120	0	10.17.94.1	toCAMPUS
		.17.94.0/24	up	direct-boot	eth0	10.17.94.120	0	-	boxnet
		99.0.0/24	up	direct-boot	eth1	62.99.0.28	0	-	toINTERNE
	E. Table	default, From all							
		0.0.0/0	up	gateway-boot	eth1	62.99.0.28	1	62.99.0.254	toINTERNE
n the left column, sel DASHBOARD CONFIGURATION	ect VR01 to	o display t	he n	etwork s	etting EVENTS	for the ssh	virt	ual rout	er VRC
In the left column, sel DASHBOARD CONFIGURATION Server Network	ect VR01 to	D display ti FIREWALL LO	he n	etwork s STATISTICS Box	etting EVENTS Sessions	for the ssh	virt	ual rout	er VR0
n the left column, sel DASHBOARD CONFIGURATION Server Network	ect VR01 to CONTROL	D display ti FIREWALL LO P Licenses	hen IGS	etwork s STATISTICS Box Box ARPs ARPs SI	etting EVENTS Sessions	for the SSH	virt	ual rout	er VR0
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n the left column, sel DASHBOARD CONFIGURATION Server Network VR Instances VR01 Configuration VR default	ect VR01 to CONTROL	O display t FIREWALL LO IPs Interfaces 127.0.0.1/8 th2, Speed=10000 192.168.0.254/32 th3, Speed=10000 52.99.0.29/32	he n GS Proxy / La DMb/s. I DMb/s. I	etwork s STATISTICS Box Para Box Ping ARPs ARPs St bel Ping op ok Duplex=Ful ok	etting EVENTS Sessions attistics OS MAC of - -	for the s	virt P S	ual rout	er VRO
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Step 7. Create an Access Rule for the Newly Created Virtual Router VR01

To pass traffic from interface eth2 (192.168.0.254/32) to eth3 (62.99.0.29/32), create an access rule and constrain the access rule to the virtual router VR01.



1. Go to CONFIGURATION > Configuration Tree > Assigned Services > NGFW (Firewall) > Forwarding Rules.

- 2. Click Lock.
- 3. Click + to add an access rule.
- 4. For the access rule type, select **Pass**.
- 5. Enter a name for the access rule. For a better differentiation between rules that apply to the default router instance and a better overview, it is recommended to prepend a prefix like 'VRF' or 'VR01' to the name of the access rule, e.g., VRF-Classroom-to-INTERNET.
 - **Source VR Instance** Select the name of the virtual router instance that you created in Step 1.
 - **Destination VR Instance** Select the name of the virtual router instance that you created in Step 1.
 - **Source** Enter the IP address of the source network, e.g., 192.168.0.0/24.
 - Service Select Any.
 - **Destination** Enter the IP address for the Internet from the list.
 - **Application Policy** In case you have licensed Application Control, you can activate it now.
 - Connection Method Select Dynamic NAT.
- 6. Click **OK**.
- 7. Click Send Changes and Activate.

Views 🔕	Pass	VRF-	Classroom1-to-INTE	RNET		
Advanced	Arr Bi-Directional		💍 🗌 Dynamic R	tule	🕘 🗌 Deactivate Rule	
ICMP Handling	Source VR Instance	VR01	\sim	Destination VR Ins	tance VR01	\sim
Object Viewer 🙁	Source		Service		Destination	
Object Viewer	<explicit-src></explicit-src>	~	Any	~	Internet	~
,	192.168.0.0/24		Ref: Any-TCP		Ref: Any	
			Ref: Any-UDP		NOT 10.0.0/8	
			Ref: ICMP		NOT 172.16.0.0/12	
			ALLIP		NOT 192.168.0.0/16	
	Authenticated User		TPS Policy		Connection Method	
	Any	~	Default Policy	~	Dynamic NAT	\sim
			Application Policy		Dynamic NAT	
			AppControl			
			SSL Inspection Pol	icy		
			N.A.	~		
			Schedule			
			Always	~		
			QoS Band (Fwd)			
			No-Shaping	\sim		
			QoS Band (Reply)			
			Like-Fwd	\sim		
					ОК	Cancel



Step 8. Activate Columns to Display the Traffic Flow Through Your Virtual Router Instance

- 1. Go to **FIREWALL > Live**.
- 2. Right-click on any of the column identifiers of the Live view.
- 3. From the menu, select Columns -> Src. VR Instance.
- 4. Right-click on any of the column identifiers of the Live view.
- 5. From the menu, select **Columns -> Dst. VR Instance**.



Step 9. Verify that Traffic is Flowing from the Source Network to the Internet

Set up a client with an IP address in the source network (e.g., 192.168.0.1) and set the default route on the client to the address of the virtual router, e.g., 192.168.0.254.

- 1. On your client, open a web browser and go to a website of your choice, e.g., www.nytimes.com
- 2. Go to **FIREWALL > Live**.
- 3. The **Live** view will display a mix of traffic flowing both through the default router and the virtual router you configured before, e.g., VR01.

٥	ASHBOARD	CONFIG	JRATION	CONTROL	L FIR	EWALL LOO	GS STATIS	TICS E	VENTS SSH							C
\$	Monitor	(A) Live	0	History 🔽	Threat Scan	Audit Log	Shaping	1 U	lsers 💍 Dy	namic 🐪	Host Forwarding Rules Rules		18 😽 Sess	ions	6 🕕	~
Traf	fic Selection	n Forward,	Local In, L	ocal Out, IPv4, IF	Pv6 ♥ S	Status Selection	Closing, Es	tablished, Faili	ng, Pending 🛛 💎	•						
ID	State	IP Protocol	Port	Source	Interface	Destination	SNAT	Output-IF	Src. VR Instance	Dst VR Instance	Application	Application Context	Rule	bit/s	Total	Idle ^
	🚓 🐥	TCP	443	192.168.0.1	eth2	34.238.209.130	62.99.0.29:63	eth3	VR01	VR01		et.nytimes.com	VRF-Classroom1-to-I	744	42.3 K	Os
I	🚓 🐥	TCP	443	192.168.0.1	eth2	74.121.136.139	62.99.0.29:38	eth3	VR01	VR01		sync.mathtag.com	VRF-Classroom1-to-I	744	10.0 K	Os
III	4 ⇒ ₽	TCP	443	192.168.0.1	eth2	54.83.166.11	62.99.0.29:35	eth3	VR01	VR01		messaging-notification.	VRF-Classroom 1-to-I	10.7 K	37.8 K	Os
II	4 ⇒ ₽	TCP	807	10.17.4.136	eth0	10.17.94.120		eth0	default	default			MGMT-ACCESS	7.9 K	93.7 K	Os
I	🚓 🐥	ICMP		62.99.0.29	eth3	62.99.0.254		eth3	VR01	VR01			OP-SRV-VPN	0	400.0	2s
I	🚓 🐥	ICMP		10.17.94.120	eth0	10.17.94.1		eth0	default	default			SOX-GW-TEST	0	390.0	7s
I	🚓 🐥	ICMP		62.99.0.28	eth1	62.99.0.254		eth1	default	default			OP-SRV-VPN	0	400.0	7s
I	🚓 🐥	TCP	443	192.168.0.1	eth2	54.197.225.116	62.99.0.29:22	eth3	VR01	VR01		pnytimes.chartbeat.net	VRF-Classroom 1-to-I	0	11.9 K	8s
	🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.196	62.99.0.29:22	eth3	VR01	VR01	G Google Services Base	www.google.com	VRF-Classroom 1-to-I	0	364.4 K	37s
	🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.196	62.99.0.29:58	eth3	VR01	VR01	G Google Services Base	www.google.com	VRF-Classroom 1-to-I	0	8.2 K	38s
	🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.19.67	62.99.0.29:48	eth3	VR01	VR01	G Google Services Base	www.google.at	VRF-Classroom 1-to-I	0	5.7 K	38s
	🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.206	62.99.0.29:53	eth3	VR01	VR01	G Google Services Base	consent.google.com	VRF-Classroom 1-to-I	0	58.4 K	39s
	🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.195	62.99.0.29:38	eth3	VR01	VR01	G Google Services Base	ssl.gstatic.com	VRF-Classroom1-to-I	0	64.9 K	40s
	🚓 🐥	TCP	443	192.168.0.1	eth2	151.101.189.164	62.99.0.29:67	eth3	VR01	VR01		static.nytimes.com	VRF-Classroom1-to-I	0	14.5 K	46s
	🚓 🐥	TCP	443	192.168.0.1	eth2	13.32.153.247	62.99.0.29:58	eth3	VR01	VR01		activity-stream-icons.s	VRF-Classroom1-to-I	0	6.1 K	48s
	🚓 🐥	TCP	443	192.168.0.1	eth2	151.101.189.164	62.99.0.29:18	eth3	VR01	VR01		a1.nyt.com	VRF-Classroom1-to-I	0	659.7 K	56s
	🚓 🐥	TCP	807	10.17.4.136	eth0	10.17.94.120		eth0	default	default			MGMT-ACCESS	0	84.2 K	14m 37s
	🚓 🐥	TCP	807	10.17.4.136	eth0	10.17.94.120		eth0	default	default			MGMT-ACCESS	0	5.9 K	50m 37s

4. In order to restrict display output only to the URL you entered before, activate a display filter for the virtual router instance by clicking on the filter symbol in any of the lines showing VR01.

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	DASHBOARD	CONFIGU	JRATION	CONTRO	L FIF	REWALL LOG	SS STATIS	TICS E	VENTS SSH							Ċ
	Monitor	(A) Live	0	History 🕻	Threat Scan	Audit Log	Shaping	1	sers 💍 Dy	namic 🐪	Host Sorwarding Rules		16 📸 Ess	ions	6 (I)	~
Tra	ffic Selection	n Forward,	Local In, L	ocal Out, IPv4, I	Pv6 💎 🕴	Status Selection	Closing, Est	ablished, Faili	ng, Pending 🛛 🔍	Src. VR Instar	VR01	×	+			
ID	State	IP Protocol	Port	Source	Interface	Destination	SNAT	Output-IF	Src. VR Instance	Dst VR Instance	Application	Application Context	Rule	bit/s	Total	Idle ^
I	. 🚓 🐥	UDP	53	192.168.0.1	eth2	9.9.9.9	62.99.0.29:98	eth3	VR01	VR01			VRF-Classroom1-to-I	0	264.0	Os
- I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	23.23.250.232	62.99.0.29:11	eth3	VR01	VR01		pnytimes.chartbeat.net	VRF-Classroom1-to-I	0	4.9 K	Os
- I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	74.121.136.139	62.99.0.29:38	eth3	VR01	VR01		sync.mathtag.com	VRF-Classroom1-to-I	0	10.7 K	3s
- I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	54.83.166.11	62.99.0.29:35	eth3	VR01	VR01		messaging-notification.	VRF-Classroom1-to-I	0	48.5 K	4s
- I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.196	62.99.0.29:22	eth3	VR01	VR01	G Google Services Base	www.google.com	VRF-Classroom1-to-I	0	364.9 K	5s
- I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	34.238.209.130	62.99.0.29:25	eth3	VR01	VR01		et.nytimes.com	VRF-Classroom 1-to-I	0	3.9 K	5s
I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.196	62.99.0.29:58	eth3	VR01	VR01	G Google Services Base	www.google.com	VRF-Classroom1-to-I	0	8.7 K	6s
I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.19.67	62.99.0.29:48	eth3	VR01	VR01	G Google Services Base	www.google.at	VRF-Classroom1-to-I	0	6.2 K	6s
I	. 🚓 🐥	ICMP		62.99.0.29	eth3	62.99.0.254		eth3	VR01	VR01			OP-SRV-VPN	0	240.0	6s
I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.206	62.99.0.29:53	eth3	VR01	VR01	G Google Services Base	consent.google.com	VRF-Classroom1-to-I	0	58.8 K	8s
I	. 🚓 🐥	TCP	443	192.168.0.1	eth2	172.217.23.195	62.99.0.29:38	eth3	VR01	VR01	G Google Services Base	ssl.gstatic.com	VRF-Classroom1-to-I	0	65.4 K	9s
	- 🚓 🐥	UDP	53	192.168.0.1	eth2	9.9.9.9	62.99.0.29:60	eth3	VR01	VR01			VRF-Classroom1-to-I	0	252.0	14s
	🚓 🐥	UDP	53	192.168.0.1	eth2	9.9.9.9	62.99.0.29:48	eth3	VR01	VR01			VRF-Classroom1-to-I	0	277.0	14s
	🚓 🐥	TCP	443	192.168.0.1	eth2	151.101.189.164	62.99.0.29:67	eth3	VR01	VR01		static.nytimes.com	VRF-Classroom1-to-I	0	14.9 K	14s
	🚓 🐥	TCP	443	192.168.0.1	eth2	13.32.153.247	62.99.0.29:58	eth3	VR01	VR01		activity-stream-icons.s.	VRF-Classroom1-to-I	0	6.5 K	17s
	- 🚓 🐥	TCP	443	192.168.0.1	eth2	151.101.189.164	62.99.0.29:18	eth3	VR01	VR01		a1.nyt.com	VRF-Classroom1-to-I	0	660.8 K	22s



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