

Application notes



version 1.0 12/27/2018

Table of Contents

1. Introduction	5
2. Backup Routing Management Protocol	6
2.1. Protocol Procedure	6
3. Configuration Examples	7
3.1. Radio/Radio – End Devices Connected via Serial Interface	7
3.2. Radio/Radio – End Devices Connected via Ethernet Interface	. 12
3.3. Ethernet/Radio	. 18
4. Summary	. 20
A. Revision History	. 21

1. Introduction

RipEX provides **Backup routes** functionality to increase reachability in networks through redundant paths.

See the following example, where we have three possible paths between RipEX A and RipEX C. The direct radio link is set as the primary path (because it is direct). The path over RipEX B is the first backup option (two hops) and if this path also fails, GPRS backup path is ready in case of radio failure. In cellular networks, data transfer is charged and so it is used as the last option here.

Path priorities can be changed according to our requirements. The path with the highest priority is always the primary one (the direct radio link in our example) and the path with the lowest priority is the last option (GPRS in our example).

Thanks to the Backup routes functionality, RipEX can handle various network problems without interrupting the desired network communication.



Fig. 1.1: Backup routes functionality example



Note

The Backup routes functionality can be used in the Router mode only.

The Backup routes functionality is supported by the SNMP, see SNMP Application Note for further details.

2. Backup Routing Management Protocol

BRMP is the proprietary protocol developed by RACOM. It handles the Backup routing functionality in RipEX networks with respect to radio network requirements.

The protocol

- · does not overload the radio network,
- · enables more than one backup path,
- · deals with a random packet loss and
- enables very fast path switching in cases of network failure.

The protocol always works between two particular RipEX units. Each RipEX network can contain various backup routes and each backup route consists of several alternative paths. We can even configure nested backup paths.

2.1. Protocol Procedure

- 1. RipEX A sends out "Hello" packets (UDP) via all possible paths to RipEX B.
- 2. RipEX B receives these packets and records them according to the received path.
- 3. RipEX B sends the list of received "Hello" packets within its own "Hello" packet back to RipEX A.
- 4. RipEX A receives this packet and evaluates the conditions of individual paths.

Individual alternative paths can obtain the following states:

Up the path is functional and can be used.

Down the path is not functional and cannot be used.

Unknown the path's state cannot be evaluated due to lack of information. This state is active immediately after the RipEX power-up or its state is not being evaluated, because a higher priority path is being used.

The route is chosen in the following way:

- 1. The first available route in the table Routing / Backup is used.
- 2. In case of a lost connection, the route on the next row of the Backup table is used (Policy / Default mode).
- 3. In situations of RSS deterioration, the route on the next row in Backup table is used (Policy / Manual mode).



Note

See the respective help for detailed parameter descriptions in RipEX web interface.

3. Configuration Examples

In this chapter, we will go through several examples in order to explain Backup routes in practice.

Please follow the examples one by one to fully understand the configuration differences and benefits of various solutions.



Note

The examples are configured similarly to the examples used in the RipEX Application note, see Address Planning in Application Notes

3.1. Radio/Radio – End Devices Connected via Serial Interface

In the first example, there are five RipEX units in a network. All end devices are connected to the RipEX units via a serial interface. It is helpful to use only the radio IP addresses for translation and data routing. Ethernet IP addresses may be assigned randomly (you can keep their defaults, however we recommend setting Ethernet addresses similar to radio IP addresses to keep things organized).



Fig. 3.1: Network topology 1

The device connected to RipEX A (10.10.10.15) is the Master station, others are slaves.

(i)
Y

Note

We will not configure RS232 devices in this Application note

The Backup routes system can be used between RipEX A (.15) and RipEX C (.17), packets can be transmitted via:

- the primary (direct) radio link between RipEX A and RipEX C, or
- the backup (indirect) radio link over RipEX B.

See the following RipEX A routing configuration:

Status	Values from:	RipEX	A								Fast rem	ote aco	cess ?
Nizards													
Settings	Interfaces												1
Routing	Radio	MAC	00:02:A9:BE	B:0F:AB			IP 10.10	0.10.15		Mask 2	55.255.255.0		
Diagnostic	ETH	MAC	00:02:A9:BE	B:0B:C3			IP 192.1	168.15.1		Mask 2	55.255.255.0		
Neighbours	Routes												1
Statistic	Destin	ation		Mas	k		Gateway	Backup		Note	e Activ	8	Modify
Statistic	10.10.10.17/32		255.	255.255.	255	10.10.1	0.17	Backup #1	Back	up RipEX	C V	-	Delete Add
Graphs	10.10.10.18/32		255.	255.255.	255	10.10.1	0.16	Off	RipE	D	~	* •	Delete Add
Ding	10.10.10.19/32		255.	255.255.	255	10.10.1	0.16	Off	RipE	(E	~		Delete Add
Ping	Default					0.0.0.0		Off					Add
Monitoring													
laintenance	Backup												1
haintenance								Alterna	tive paths				
	Name		Peer IF	Р	Hyster	esis	SNMP Trap	Gateway	Policy	Active	Note		Modify
	Backup #1		10.10.10.17		20								Delete Ad
								10.10.10.17	Default	-	Direct link		* <u>Ad</u>
								10 10 10 10	Default		Indiract link		

Fig. 3.2: RipEX A Routing menu - example #1

In RipEX A, we have one route which uses the backup configuration and two simple routes to other RipEX units.

The backup route is named "Backup #1" and it checks its health against the RipEX C radio IP address. The highest priority is set to the direct link and the second possibility is to use RipEX B as a repeater. Both paths are now checked by default and both are Up.



Note

Only the remote RipEX radio or the main Ethernet interface IP addresses can be used (no subnet IP addresses on RipEX Ethernet or IP of connected device behind RipEX).

See the respective configurations from RipEX B and C.

Status	Values fro	om: RipEX B			Remote	IP 10.10.10.1	6	Connect	Dis	sconnect
Vizards										
Settings	Interfac	es								
Routing	Radio	MAC 00	02:A9:BA:54:2B	IP	10.10.10.16		Mask	255.255.25	5.0	
Diagnostic	ETH	MAC 00	02:A9:BA:50:43	IP	192.168.16.1		Mask 2		5.0	
Neighbours	Routes						Note			
Statistic	De	stination	Mask	Gateway	В	ackup	Note		Active	Modify
otatione	10.10.10.18	3/32	255.255.255.255	10.10.10.17	Off		RipEX D		~	Telete Add
Graphs	10.10.10.19	9/32	255.255.255.255	10.10.10.17	Off		RipEX E		~	Delete Add
Ping	Default			0.0.0.0	Off					Add
Monitoring	Backup)								
laintenance					Alte	rnative paths	5			
	Name	Peer IP	Hysteresis	SNMP Trap	Gateway	Policy	Active	Note		Modify
										Add

Fig. 3.3: RipEX B Routing menu - example #1

(i) Note

RipEX B is not the end point (Peer IP) of the Backup routes system and so there is no backup route defined.

Status	Values fro	m: RipEX	С				Remote IP 10.1	0.10.17	С	onnect	Dis	connect	?
Wizards													
Settings	Interfac	es											?
Routing	Radio	MAC	00:02:A9:BA:73:6	B		IP 10.10	.10.17	N	Mask 2	55.255.255.	0		
Diagnostic	ETH	MAC	00:02:A9:BA:6F:8	33		IP 192.1	68.17.1	N	Mask 2	55.255.255.0	0		
Neighbours	Routes												?
Statistic	Des	stination		Mask	Gate	eway	Backup		Note	•	Active	Mo	dify
Statistic	10.10.10.15	/32	255.255.2	55.255	10.10.10.15		Backup #1	Backu	p RipE)	(A		Delete	e Add
Graphs	Default				0.0.0.0		Off						Add
Ping	Backup												?
Monitoring	•						Alterna	tive paths					
laintenance	Nam	e	Peer IP	Hys	teresis S	SNMP Trap	Gateway	Policy	Active	No	ote	Me	odify
namenance	Backup #1		10.10.10.15	20		ana 🗌 ang ng						De	lete Add
							10.10.10.15	Default	~	Direct link			Add
							10.10.10.16	Default	~	Indirect lin	k	*	Add

Fig. 3.4: RipEX C Routing menu – example #3



Note

See the configuration of RipEX D and E in the Application Note, see Address Planning in Application Notes

3.1.1. Practical Test

In this scenario, we will switch to the backup path due to a low RSS value. We must change the policy for the primary path to enable RSS checks. Click on the respective "Default" button in the **Policy** column.



Note

You can check the connectivity with a Ping feature (**Diagnostic** \rightarrow **Ping**).

Status	Values from: R	RipEX A								Fastre	emot	te access	
Nizards													
Settings	Interfaces												7
Routing	Radio	MAC 00):02:A9:BB:0F:AI	В		IP 10.10	0.10.15	N	Mask 2	55.255.255.0			
Diagnostic	ETH	MAC 00):02:A9:BB:0B:C	3		IP 192.1	68.15.1	N	Mask 2	55.255.255.0			
Neighbours	Routes							ackup No #1 Backup Rip[1
Statistic	Destina	tion	M	ask		Gateway	Backup	ackup Note #1 Backup RipE		Act	tive	Modify	
Statistic	10.10.10.17/32		255.255.25	5.255	10.10.1	0.17	Backup #1	Backu	p RipEX	C	1	Telete Ad	d
Graphs	10.10.10.18/32		255.255.25	5.255	10.10.1	0.16	Off	RipEX	D		1	▲ ▼ Delete Ad	d
Ping	10.10.10/32		255.255.25	5.255	10.10.1	0.16	Off	RipEX	E		1	Delete Ad	d
r mg	Default				0.0.0.0		Off			anaanaanaa kan E	S. and	Ad	d
Monitoring													
laintenance	Backup												-
							Alterna	tive paths					
	Name	10	Peer IP	Hy	steresis	SNMP Trap	Gateway	Policy	Active	Note		Modif	y
	Баскир #1	10.	10.10.17	20			10 10 10 17	Default		Direct link		Delete	Add
							10.10.10.17	Default		Indirect link		•	Ad
							10.10.10.10	Doladit	in the second	indi oot inik			Ad

Fig. 3.5: RipEX A – Policy button

The new pop-up window appears. Change the Parameters to "Manual" and fill in the RSS [-dBm] value according to the current RSS value (see the Neighbours menu). The value needs to be higher than the current value, e.g. in the example, the current RSS value is -56 dBm. The condition for switching to the backup (indirect) path is set to -50 dBm.

Policy	
Parameters	Manual
Hello packet period [sec.]	60
Hello packet success rate [%	6] 87.5 v
RSS [-dBm]	50
Lower priority paths checking	g On 🔻
(OK Cancel

Fig. 3.6: RipEX A – Alternative path RSS change

Apply the changes and click on the Backup status button to see the changes. The policy is set to "Manual" and the backup (indirect) path is being used.

Status	Values from: F	RipEX	A						Fa	st remo	te access	?
Wizards												
Settings	Interfaces											1
Routing	Radio	MAC	00:02:A9:BB:0F:A	В		IP 10.10	0.10.15	Masl	255.255.255	0		
Diagnostic	ETH	MAC	00:02:A9:BB:0B:C	3		IP 192.1	168.15.1	Masi	255.255.255	0		
Neighbours	Routes											7
Statistic	Destina	ation	M	lask		Gateway	Backup	N	ote	Active	Mod	dify
Statistic	10.10.10.17/32		255.255.25	55.255	10.10.1	0.16	Backup #1	Backup Ri	DEX C	•	Telete	Add
Graphs	10.10.10.18/32		255.255.25	5.255	10.10.1	0.16	Off	b #1 Backup RipE RipEX D		•	* Telete	Add
Ping	10.10.10.19/32		255.255.25	5.255	10.10.1	0.16	Off	RipEX E		•	Delete	Add
Monitoring	Default				0.0.0.0		Off		aaaaaaaaaaa			Add
Monitoring	Backup											10101010
Maintenance							Alterna	tive paths				
	Name		Peer IP	Hy	steresis	SNMP Trap	Gateway	Policy Act	ive No	ote	Mo	odify
	Backup #1	1	0.10.10.17	20				\sim			Del	lete Ad
							10.10.10.17	Manual V	Direct link		-	Ad
	SSS and a contract of the second						10.10.10.16	Default v	Indirect li	nk	1100 *	Ad

Fig. 3.7: RipEX A – Backup path is Up

(i)

Note

For proper functioning, do not forget to repeat these steps on the partner RipEX C unit. If not set on both units, RipEX A can communicate with RipEX C via the primary path in one direction and via the backup path in the other direction (asymmetric routing).

To revert to using the primary path again, disable RSS checks or improve the RSS signal between the RipEX units.

3.2. Radio/Radio – End Devices Connected via Ethernet Interface

In the second example, we use the same configuration except that the RTU devices are connected via the Ethernet interface. See the following diagram:



Fig. 3.8: Network topology 2



Note

In this example, we switched the priorities for the alternative paths.

RTU units are now connected via the Ethernet ports, which means we need to add the correct IP addresses and routing into the appropriate RipEX units.

If not already set, change the Ethernet IP addresses according to this topology:

- RipEX A 192.168.15.1/24
- RipEX B 192.168.16.1/24
- RipEX C 192.168.17.1/24
- ...

Now we need to add the correct routing. To make the example simple, we will ignore RipEX D and RipEX E in our configuration.

See the following RipEX A routing settings:

Status	Values from: Rip	EX A							Fas	t remote	access	?
Wizards												
Settings	Interfaces											1010101010
Routing	Radio M/	AC 00:02:A9:BE	B:OF:AB		IP 10.1	0.10.15		Mask 2	55.255.255.0)		
Diagnostic	ETH M/	AC 00:02:A9:BE	B:0B:C3		IP 192.	168.15.1		Mask 2	55.255.255.0			
Neighbours	Routes											1
Statistic	Destinatio	on	Mask		Gateway	Backup		Note	. 1	Active	Mo	dify
Statistic	192.168.16.0/24	255.	255.255.0	10.10.1	0.16	Off	RipE	В		•	Telete	e Add
Graphs	192.168.17.0/24	255.	255.255.0	10.10.1	0.16	Backup #1	RipE)	(C		V 4	Delete	e Add
Ping	Default			0.0.0.0		Off						Add
Monitoring	Backup											1
laintenance			_			Altern	ative paths					
	Name Rockup #1	Peer I	2	Hysteresis	SNMP Trap	Gateway	Policy	Active	No	te	M	odify
	Dackup #1	192.100.17.1	2	.	_	10,10,10,16	Default		Indirect lin	k		Ad
						10.10.10.17	Default	~	Direct link			Ad
												Ad

Fig. 3.9: RipEX A Routing menu – example #2

Notice that we are using the Backup routes system for the devices on the 192.168.17.0/24 network. Also notice that we filled the Peer IP with the remote RipEX Ethernet IP address. The path used currently is the primary (indirect) one, but both paths are marked in color "Up".



Note

Only the remote RipEX radio or the main Ethernet interface IP addresses can be used (no subnet IP addresses on RipEX Ethernet or IP of connected device behind RipEX).

					Kemole	Connection	Active					
Status	Values fro	om: RipEX B			Remote	IP 10.10.10.	16	Connect	Dis	sconnect ?		
Vizards												
ettings	Interfac	es										
Routing	Radio	MAC 00:	02:A9:BA:54:2B	IP	10.10.10.16		Mask	255.255.25	i5.0			
Diagnostic	ETH	MAC 00:	02:A9:BA:50:43	IP	192.168.16.1		Mask 255.255		5.0			
Neighbours	Routes						Note					
Statistic	De	stination	Mask	Gateway	E	Backup	No	ote	Active	Modify		
otatistic	192.168.15	.0/24	255.255.255.0	10.10.10.15	Off		RipEX A		RipEX A		~	Delete Add
Graphs	192.168.17	.0/24	255.255.255.0	10.10.10.17	Off		RipEX C		~	Delete Add		
Ping	Default			0.0.0.0	Off					<u>Add</u>		
Monitoring	Backup	1										
laintenance					Alt	ernative path	IS					
laintenanee	Name	Peer IP	Hysteresis	SNMP Trap	Gateway	Policy	Active	Note		Modify		
										Add		

Fig. 3.10: RipEX B Routing menu – example #2

We also added paths in RipEX B for the Ethernet networks located behind other RipEX units.

Status	Values from: Rip	EX (C					Remote IP 10.1	0.10.17	C	onnect	Dis	connect	?
Wizards														
Settings	Interfaces													7
Routing	Radio M	AC	00:02:A9:BA:73:6B]		IP	10.10.	10.17		Mask 2	55.255.255	.0		
Diagnostic	ETH M.	AC	00:02:A9:BA:6F:83]		IP	192.16	58.17.1		Mask 2	55.255.255	.0		
Neighbours	Routes													?
Statistic	Destinatio	on	Ma	ask	0	Sateway		Backup		Note	•	Active	Мо	dify
otatistic	192.168.15.0/24		255.255.25	5.0	10.10.10	.16		Backup #1	RipE	XA		v	Telet	e Add
Graphs	192.168.16.0/24		255.255.25	5.0	10.10.10	.16		Off	RipE	хв		~	Delet	e Add
Ping	Default				0.0.0.0			Off						Add
Monitoring	Backup													7
Agintenance								Alterna	tive paths					
antenance	Name		Peer IP	Hys	steresis	SNMP	Trap	Gateway	Policy	Active	N	ote	M	lodify
	Backup #1	1	92.168.15.1	20									De	elete Ad
								10.10.10.16	Default	~	Indirect I	ink		Add
								10.10.10.15	Default	~	Direct link		in the second	Add

Fig. 3.11: RipEX C Routing menu – example #2

In RipEX C we have a very similar configuration to RipEX A, just in the opposite direction.

3.2.1. Practical Test

In this example, we will use a different method to switch between the primary and backup paths. We have set the highest priority for the indirect link (our backup path in the previous example). Whenever RipEX B is switched off, the Backup routes system will use the direct path instead.

The RipEX failure detection time is based on the Policy settings.

Note: If you set the "Hello" **packet period** to a low value (e.g. 10 seconds) and "**Hello packet success rate** [%]" to 100 %, the procedure will be very fast. But with these settings you are wasting the radio bandwidth with quite a lot of traffic and whenever a single "Hello" packet is lost, the active path is labeled as "Down".

In the example, we will not alter the default values.

Parameters	Default 💌
Hello packet period [sec.]	60
Hello packet success rate	[%] 87.5
RSS [-dBm]	Off
Lower priority paths checki	ng On

Fig. 3.12: Default Policy values



Note

"Hello packet success rate" evaluation is based on last 8 "Hello" packets.

To see the whole procedure, you can start with issuing ping packets. Go to the RipEX A **Diagnostic** \rightarrow **Ping** menu and fill in the destination IP address (192.168.17.1). At this stage, ping packets will be successful and will be transmitted via the primary (indirect) path (e.g. check the RipEX RX/TX led diodes).

Status	Values from: RipEX A	Fast remote access ?
Wizards		
Settings	Ping	
Routing	Ping Type ICMP Length [bytes] 80	Period [ms] 1000
Diagnostic	Destination 192.168.17.1 Count 1000	Timeout [ms] 10000
Neighbours		
Statistic	PING 192.168.17.1 (192.168.17.1) 80(108) bytes of data.	
	88 bytes from 192.168.17.1: icmp_req=2 ttl=63 time=446 ms	
Graphs	88 bytes from 192.168.17.1: icmp_req=3 ttl=63 time=360 ms	
> Ping	88 bytes from 192.168.17.1: icmp_req=4 ttl=63 time=360 ms	
	88 bytes from 192.168.17.1: icmp_req=5 ttl=63 time=395 ms	
Monitoring	88 bytes from 192.168.17.1: icmp_req=6 ttl=63 time=343 ms	
Maintenance	88 bytes from 192.168.17.1: icmp_req=7 ttl=63 time=412 ms	
	88 bytes from 192.168.17.1: icmp_req=8 ttl=63 time=309 ms	
	88 bytes from 192.168.17.1: icmp_req=9 ttl=63 time=412 ms	
	88 bytes from 192.168.17.1: icmp_req=10 ttl=63 time=480 ms	
	88 bytes from 192.168.17.1: icmp_req=11 ttl=63 time=378 ms	
	88 bytes from 192.168.17.1: icmp_req=12 ttl=63 time=343 ms	

Fig. 3.13: Successful ping packets - primary (indirect) path

You can also turn on the radio interface monitoring. Go to the **Diagnostic** \rightarrow **Monitoring** menu and check the radio interface. Leave other parameters at their defaults and click on the Start button. You can see all the packets in the radio network (ping packets, "Hello" packets, ARP, ...).

Now turn RipEX B off, and see the differences. You can see that there are no replies to ping packets in **Ping** and **Monitoring** menu. Check the Routing menu (by pressing the Backup status button) to see when the active path is switched to the backup (direct) path.

Status	Values from: RipE	X A							Fas	t remo	te access	?
Wizards												
Settings	Interfaces											?
Routing	Radio MAG	C 00:02:A9:BB:0F	02:A9:BB:0F:AB 02:A9:BB:0B:C3			0.10.15		Mask 255.255.255				
Diagnostic	ETH MAG	C 00:02:A9:BB:08				.168.15.1		Mask 255.255.25			55.0	
Neighbours	Routes											?
Statistic	Destination	1	Mask	(Sateway	Backup		Note A		ctive	Mo	dify
Statistic	192.168.16.0/24	192.168.16.0/24 255.25		55.0 10.10.10		.16 Off		RipEX B		v	T Delete	e Add
Graphs	192.168.17.0/24	255.255	6.255.0	10.10.10	.17	7 Backup #1		RipEX C		-	Delete	e <u>Add</u>
Ping	Default			0.0.0.0		Off						Add
Monitoring	Backup											?
Maintenance						Alterna	tive paths					
	Name	Peer IP	Hy	steresis	SNMP Trap	Gateway	Policy	Active	Not	e	M	odify
	Backup #1	192.168.17.1	20			10 10 10 10	Default	1.0000	landlan ak Bala		De	elete Add
						10.10.10.16	Default	~	Direct link			Add
						10.10.10.17	Default	Y	Direct link		1111 -	Add

Fig. 3.14: RipEX A Routing menu - RipEX B switched off

As soon as the Backup routes system evaluates the situation correctly, the ping packets are successful again. Also notice the ping packets RTT value is lower than with the primary (indirect) path being used.

```
ping: recvmsg: No route to host
ping: recvmsg: No route to host
From 192.168.15.1: icmp_seq=558 Destination Host Unreachable
From 192.168.15.1: icmp_seq=559 Destination Host Unreachable
88 bytes from 192.168.17.1: icmp_req=563 ttl=64 time=174 ms
88 bytes from 192.168.17.1: icmp_req=565 ttl=64 time=174 ms
```

Fig. 3.15: RipEX A Ping packets – backup (direct) path

Now you can turn RipEX B back on again. Because RipEX checks the primary (indirect) path with "Hello" packets periodically, it will switch back to the primary path. This change will not cause any loss in ping packets.

3.3. Ethernet/Radio

In this test, the primary route is via the Ethernet link and it is backed up by the radio link.

See the following example:



Fig. 3.16: Network topology 3



Note

This example will not be explained in as such detail as the previous ones and we will use different IP addresses.

	The second s	UPEA	A							Fast remot	te access	?
Vizards												
ettings	Interfaces											1
louting	Radio	MAC	00:02:A9:BB:0F:AB IP 10.10.				10.10.1		Mask 255.	255.255.0		
Jiagnostic	ETH	MAC	00:02:A9:BB:0B:C3 IP 192.				2.168.100.1	255.255.0	5.255.0			
Neighbours	Routes											7
Ctationia	Destina	tion	Mask		Gateway		Backup)	Note		Modify	
Statistic	192.168.2.0/24		255.255.255.0		192.168.100.2		Backup #1	kup #1		✓ ▼ Delete		e Add
Graphs	192.168.100.2/3	2	255.255.255.255		192.168.100.2		Backup #1			✓ ▲ <u>Dele</u>		e Add
Ping	Default		ananan <mark>sinananana</mark>		0.0.0.0		Off			aaaaa 🛄 aa		Add
Monitoring	Backup											1
laintenance							Alterr	native paths				
aintenance	Name		Peer IP	Hys	steresis	SNMP Trap	Gateway	Policy	Active	Note	Me	odify
	Backup #1	1	92.168.100.2	20				\frown			De	lete Ad
							192.168.100.2	Manual	~		•	Ad
	1. Contract and the second territory of t						10.10.10.2	Default	~		A	Ad

Fig. 3.17: RipEX A Routing menu – example #3

The primary Ethernet link provides a high bandwidth capacity. It is appropriate to send "Hello" packets every second. This will lead to a rapid switch over to the backup radio link in case of the Ethernet link failure.

```
ping: recvmsg: No route to host
ping: recvmsg: No route to host
From 192.168.15.1: icmp_seq=558 Destination Host Unreachable
From 192.168.15.1: icmp_seq=559 Destination Host Unreachable
88 bytes from 192.168.17.1: icmp_req=563 ttl=64 time=174 ms
88 bytes from 192.168.17.1: icmp_req=564 ttl=64 time=157 ms
88 bytes from 192.168.17.1: icmp_req=565 ttl=64 time=174 ms
```

Fig. 3.18: Hello packet period set to one second

RipEX B is configured with 192.168.100.2/24 IP address which is used only for communication between RipEX units. The additional subnet 192.168.2.0/24 is used for the rest of the Ethernet communication. See the details in ARP Proxy & VLAN Application note.

The "Hello" packet period for the Ethernet link is also set to one second on RipEX B.

Status	Values from: Rig	EX B					Remote IP 10.10).10.2	Conn	ect Dis	connect ?	
Wizards												
Settings	Interfaces										?	
Routing	Radio MAC	00:02:A	9:BA:73:6B		IP 10	0.10.10.2	Mask	255.255.255.	0			
Diagnostic	ETH MAC	9:BA:6F:83		IP 192.168.100.2		Mask 255.255.255.0		0	VLAN & Subnets 🔻			
Neighbours	Routes										?	
Statistic	Destinati	on	Mas		Gateway		Backup		Note	Active	Modify	
Statistic	192.168.100.1/32		255.255.25	55.255.255.255			Backup #1			v	Delete Add	
Graphs	Default	Default		0.0.0.0			Off				<u>Add</u>	
Ping	Backup										?	
Monitoring							Alternat	tive paths				
Maintananaa	Name		Peer IP	Hys	teresis	SNMP Trap	Gateway	Policy	Active	Note	Modify	
wannenance	Backup #1	192.16	8.100.1	20				\sim			Delete Add	
							192.168.100.1	Manual	v		× Add	
							10.10.10.1	Default	v		Add	
											Add	

Fig. 3.19: RipEX B Routing menu - example #3

When you disconnect the primary Ethernet path, the system will automatically switch to its backup radio path. You can check this functionality using the same tools as in the previous examples.

4. Summary

We have described just a few basic examples of Backup routes usage. Feel free to download the RipEX User manual from http://www.racom.eu/download/hw/ripex/free/eng/ripex-m-en.pdf or the Application notes from http://www.racom.eu/download/hw/ripex/free/eng/ripex-app-en.pdf to conduct further tests.

Do not hesitate to contact us if you have any questions:

RACOM technical support team E-mail: <support@racom.eu> Tel.: +420 565 659 511

Appendix A. Revision History

Revision 1.0 First issue 2017-11-23