

WRR(Weighted Round Robin)

(v1.0)

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WRR(WEIGHTED ROUND ROBIN)

❖ IPv4 Basic TCP Load Balancing Test with WRR(Weighted Round Robin) Algorithm

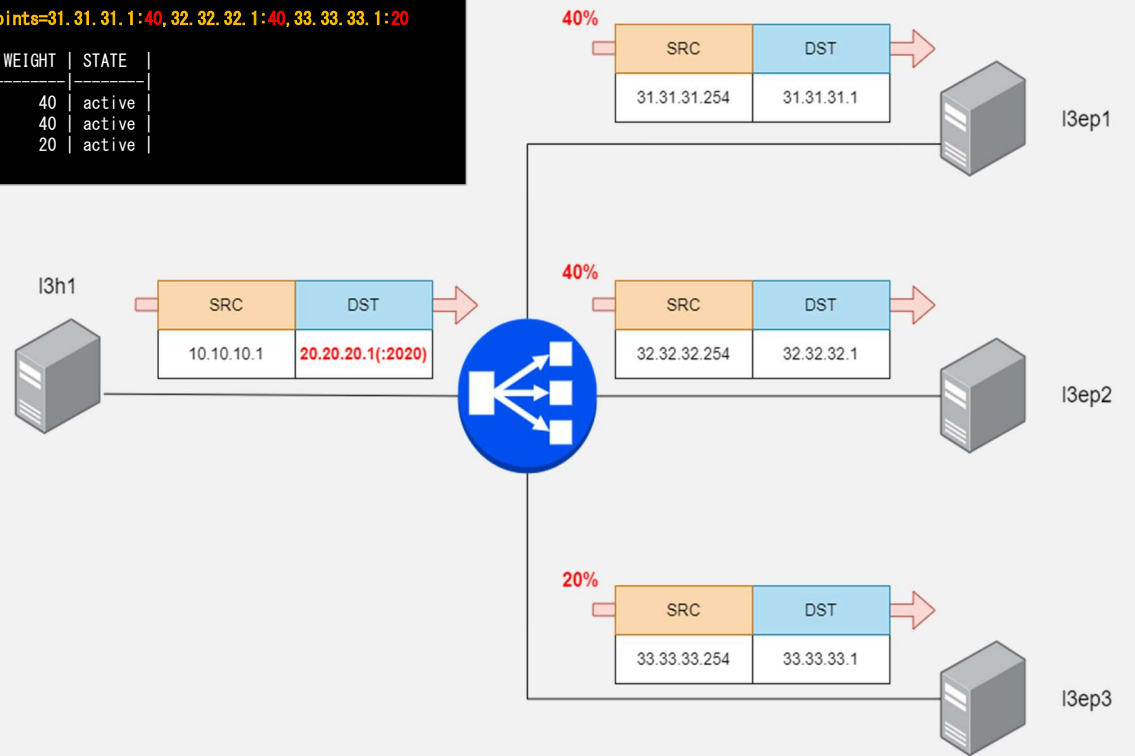
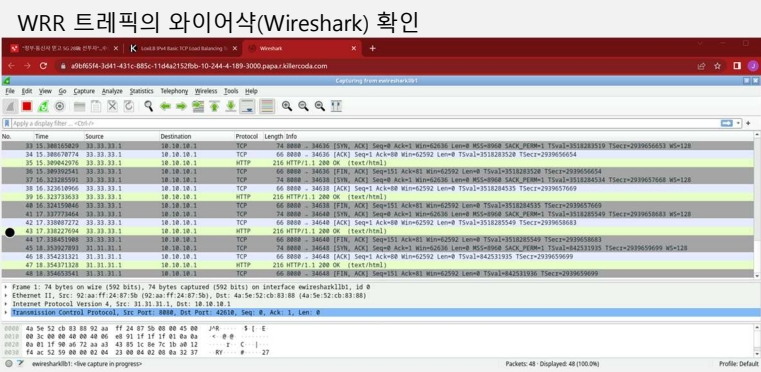
- o loxicmd create lb 20.20.20.1 --select=priority --tcp=2020:8080 --endpoints=31.31.31.1:40,32.32.32.1:40,33.33.33.1:20

```

root@97e71197b1df:/# loxicmd create lb 20.20.20.1 --select=priority --tcp=2020:8080 --endpoints=31.31.31.1:40,32.32.32.1:40,33.33.33.1:20
root@97e71197b1df:/# loxicmd get lb -o wide

```

EXTERNAL IP	PORT	PROTOCOL	BLOCK	SELECT	MODE	ENDPOINT IP	TARGET PORT	WEIGHT	STATE
20.20.20.1	2020	tcp	0	priority	default	31.31.31.1	8080	40	active
						32.32.32.1	8080	40	active
						33.33.33.1	8080	20	active



Source: <https://killercoda.com/netlox>



WRR 테스트 환경

❖ IPv4 Basic TCP Load Balancing Test with WRR(Weighted Round Robin) Algorithm

- Achieving LoxiLB IPv4 Basic TCP Load Balancing Test with WRR algorithm

```

ubuntu $ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS                NAMES
3412edc42bfc   lscr.io/linuxserver/wireshark:latest /init                   About a minute ago Up About a minute   wireshark
d8b4fb335337   eyes852/ubuntu-iperf-test:0.5      bash                    2 minutes ago Up 2 minutes        l3ep3
38e47d6607c4   eyes852/ubuntu-iperf-test:0.5      bash                    2 minutes ago Up 2 minutes        l3ep2
2bb62e32a99b   eyes852/ubuntu-iperf-test:0.5      bash                    2 minutes ago Up 2 minutes        l3ep1
536c2bca92ea   eyes852/ubuntu-iperf-test:0.5      bash                    2 minutes ago Up 2 minutes        l3h1
97e71197b1df   ghcr.io/loxilb-io/loxilb:latest    /root/loxilb-io/lox... 2 minutes ago Up 2 minutes        11111/tcp, 22222/tcp l1b1
ubuntu $ docker exec -it l1b1 loxicmd help
A longer description that spans multiple lines and likely contains
examples and usage of using your application. For example:

Cobra is a CLI library for Go that empowers applications.
This application is a tool to generate the needed files
to quickly create a Cobra application.

Usage:
  loxicmd [command]

Available Commands:
  apply      Apply configuration
  completion Generate the autocompletion script for the specified shell
  create     Create a Load balance features in the LoxiLB.
  delete     Delete a Load balance features in the LoxiLB.
  get       A brief description of your command
  help      Help about any command
  save      saves current configuration

Flags:
  -s, --apiserver string Set API server IP address (default "127.0.0.1")
  -h, --help             help for loxicmd
  -o, --output string   Set output layer (ex.) wide, json
  -p, --port int16      Set API server port number (default 11111)
  --protocol string     Set API server http/https (default "http")
  -t, --timeout int16  Set timeout (default 5)

Use "loxicmd [command] --help" for more information about a command.
ubuntu $

```

Source: <https://killercoda.com/netlox/scenario/loxilb-wrrtcp1b>



WRR 테스트 구성

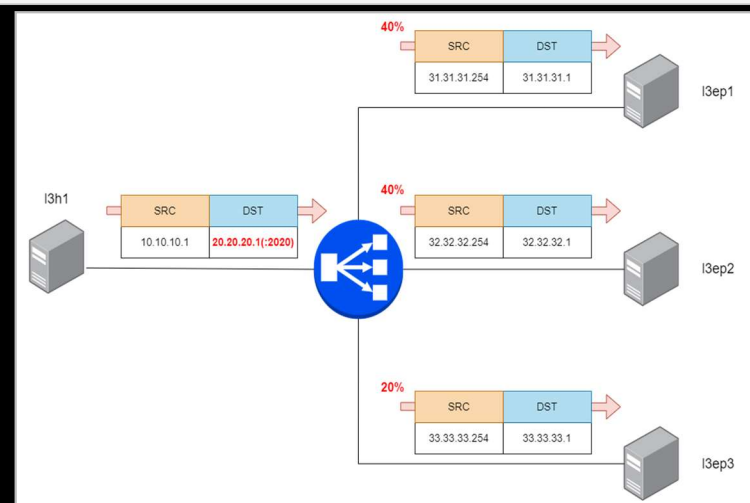
❖ IPv4 Basic TCP Load Balancing Test with WRR(Weighted Round Robin) Algorithm

- Check Topology for WRR

```

ubuntu $ ip netns exec l3ep1 ifconfig eth0
ubuntu $ ip netns exec l3ep2 ifconfig eth0
ubuntu $ ip netns exec l3ep3 ifconfig eth0
ubuntu $ ip netns exec l3h1 ifconfig eth0
ubuntu $ ip netns exec llb1 route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
0.0.0.0 172.17.0.1 0.0.0.0 UG 0 0 0 eth0
10.10.10.0 0.0.0.0 255.255.255.0 U 0 0 0 e llb1l3h1
31.31.31.0 0.0.0.0 255.255.255.0 U 0 0 0 e llb1l3ep1
32.32.32.0 0.0.0.0 255.255.255.0 U 0 0 0 e llb1l3ep2
33.33.33.0 0.0.0.0 255.255.255.0 U 0 0 0 e llb1l3ep3
172.17.0.0 0.0.0.0 255.255.0.0 U 0 0 0 0 eth0
ubuntu $ ip netns exec llb1 ping 31.31.31.1
ubuntu $ ip netns exec llb1 ping 32.32.32.1
ubuntu $ ip netns exec llb1 ping 33.33.33.1
ubuntu $ ip netns exec llb1 ping 10.10.10.1
ubuntu $ cd ~/
ubuntu $ dir
common.sh config-mirror.sh config.sh filesystem rmconfig-mirror.sh rmconfig.sh server1.js server2.js server3.js start.sh validation.sh
ubuntu $ sudo /bin/bash ./config.sh
#####
Configuring LoxilB Basic TCP Policy
#####
ProtoPortpair: map[tcp:[2020:8080]]
Debug: response.StatusCode: 200
ubuntu $ docker exec -it llb1 bash
root@8b74b5ddc4d2:/# loxicmd create lb 20.20.20.1 --select=priority --tcp=2020:8080 --endpoints=31.31.31.1:40,32.32.32.1:40,33.33.33.1:20

```



Source: <https://killercoda.com/netlox/scenario/loxilb-wrrtcp1b>



WRR 시험

❖ IPv4 Basic TCP Load Balancing Test with WRR(Weighted Round Robin) Algorithm

- Configure LoxiLB Rules and Check configuration

```
root@97e71197b1df:~# loxicmd get lb -o wide
```

EXTERNAL IP	PORT	PROTOCOL	BLOCK	SELECT	MODE	ENDPOINT IP	TARGET PORT	WEIGHT	STATE
20.20.20.1	2020	tcp	0	priority	default	31.31.31.1	8080	40	active
						32.32.32.1	8080	40	active
						33.33.33.1	8080	20	active

```
root@97e71197b1df:~#
```

```
ubuntu $ cd ~/
ubuntu $ sudo ./bin/bash ./validation.sh
SCENARIO-wrrtcp1b1
server1 UP
server2 UP
server3 UP
server1
server1
server1
server1
server1
server1
server2
server2
server2
server2
server2
server2
server3
server3
server3
server1
./validation.sh: line 54: 25902 Killed                  $hexec l3ep1
node ./server1.js
./validation.sh: line 54: 25903 Killed                  $hexec l3ep2
node ./server2.js
./validation.sh: line 54: 25904 Killed                  $hexec l3ep3
node ./server3.js
SCENARIO-wrrtcp1b2 [OK]
```

```
source ./common.sh
connect_docker_hosts_default_ns l1b1 wireshark

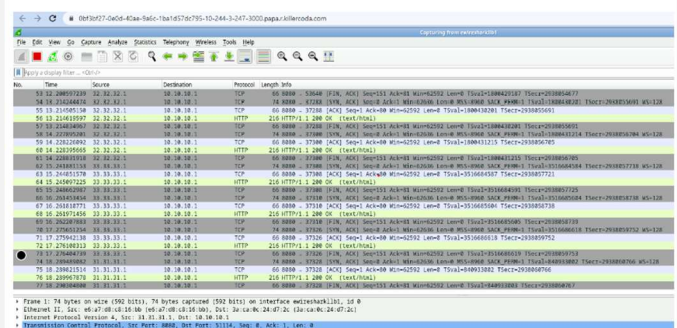
./config-mirror.sh 1 e11b113ep1 e11b1wireshark
./config-mirror.sh 2 e11b113ep2 e11b1wireshark
./config-mirror.sh 3 e11b113ep3 e11b1wireshark
```

```
./config-mirror.sh 1 e11b113ep1 e11b1wireshark
./config-mirror.sh 2 e11b113ep2 e11b1wireshark
./config-mirror.sh 3 e11b113ep3 e11b1wireshark
```

1 is unique id for mirror object.

Access Wireshark for Analytics [ACCESS WIRESHARK](#) and select ewireshark11b1 as capturing port.

You can check as like following figure:



(2) Delete Mirror Object

```
./rmconfig-mirror.sh 1
./rmconfig-mirror.sh 2
./rmconfig-mirror.sh 3
```

Source: <https://killercoda.com/netlox/scenario/loxilib-wrrtcp1b>



와이어샹크(WIRESHARK)

❖ IPv4 Basic TCP Load Balancing Test with WRR(Weighted Round Robin) Algorithm

- Validate LoxiLB Rules
- Access Wireshark for Analytics [ACCESS WIRESHARK](#) and select **ewiresharkllb1** as capturing port.

The screenshot shows the Wireshark interface with the following details:

- Packet List:**

No.	Time	Source	Destination	Protocol	Length	Info
33	15.308165029	33.33.33.1	10.10.10.1	TCP	74	8080 → 34636 [SYN, ACK] Seq=0 Ack=1 Win=62636 Len=0 MSS=8960 SACK_PERM=1 TSval=3518283519 TSecr=2939656653 WS=128
34	15.308670774	33.33.33.1	10.10.10.1	TCP	66	8080 → 34636 [ACK] Seq=1 Ack=80 Win=62592 Len=0 TSval=3518283520 TSecr=2939656654
35	15.309042976	33.33.33.1	10.10.10.1	HTTP	216	HTTP/1.1 200 OK (text/html)
36	15.309392541	33.33.33.1	10.10.10.1	TCP	66	8080 → 34636 [FIN, ACK] Seq=151 Ack=81 Win=62592 Len=0 TSval=3518283520 TSecr=2939656654
37	16.323285591	33.33.33.1	10.10.10.1	TCP	74	8080 → 34638 [SYN, ACK] Seq=0 Ack=1 Win=62636 Len=0 MSS=8960 SACK_PERM=1 TSval=3518284534 TSecr=2939657668 WS=128
38	16.323610966	33.33.33.1	10.10.10.1	TCP	66	8080 → 34638 [ACK] Seq=1 Ack=80 Win=62592 Len=0 TSval=3518284535 TSecr=2939657669
39	16.323733633	33.33.33.1	10.10.10.1	HTTP	216	HTTP/1.1 200 OK (text/html)
40	16.324159046	33.33.33.1	10.10.10.1	TCP	66	8080 → 34638 [FIN, ACK] Seq=151 Ack=81 Win=62592 Len=0 TSval=3518284535 TSecr=2939657669
41	17.337773464	33.33.33.1	10.10.10.1	TCP	74	8080 → 34640 [SYN, ACK] Seq=0 Ack=1 Win=62636 Len=0 MSS=8960 SACK_PERM=1 TSval=3518285549 TSecr=2939658683 WS=128
42	17.338087272	33.33.33.1	10.10.10.1	TCP	66	8080 → 34640 [ACK] Seq=1 Ack=80 Win=62592 Len=0 TSval=3518285549 TSecr=2939658683
43	17.338227694	33.33.33.1	10.10.10.1	HTTP	216	HTTP/1.1 200 OK (text/html)
44	17.338451908	33.33.33.1	10.10.10.1	TCP	66	8080 → 34640 [FIN, ACK] Seq=151 Ack=81 Win=62592 Len=0 TSval=3518285549 TSecr=2939658683
45	18.353927893	31.31.31.1	10.10.10.1	TCP	74	8080 → 34648 [SYN, ACK] Seq=0 Ack=1 Win=62636 Len=0 MSS=8960 SACK_PERM=1 TSval=842531935 TSecr=2939659699 WS=128
46	18.354231321	31.31.31.1	10.10.10.1	TCP	66	8080 → 34648 [ACK] Seq=1 Ack=80 Win=62592 Len=0 TSval=842531935 TSecr=2939659699
47	18.354371328	31.31.31.1	10.10.10.1	HTTP	216	HTTP/1.1 200 OK (text/html)
48	18.354653541	31.31.31.1	10.10.10.1	TCP	66	8080 → 34648 [FIN, ACK] Seq=151 Ack=81 Win=62592 Len=0 TSval=842531936 TSecr=2939659699
- Packet Details (Frame 1):**
 - Ethernet II, Src: 92:aa:ff:24:87:5b (92:aa:ff:24:87:5b), Dst: 4a:5e:52:cb:83:88 (4a:5e:52:cb:83:88)
 - Internet Protocol Version 4, Src: 31.31.31.1, Dst: 10.10.10.1
 - Transmission Control Protocol, Src Port: 8080, Dst Port: 42610, Seq: 0, Ack: 1, Len: 0
- Raw:** Hex and ASCII representation of the captured frame.

Source: <https://killercoda.com/netlox/scenario/loxilib-wrrtcp/1b>





**THANK
YOU**