

How to disable MAC learning in a Linux bridge

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Question: I am troubleshooting Ethernet bridging which I set up with a Linux bridge, and I would like to disable MAC learning on the Linux bridge. How can I do that?

An Ethernet bridge is a network component which interconnects multiple Ethernet networks by forwarding packets from one network to another. Linux has a software implementation of the Ethernet bridge (called "Linux bridge") incorporated into the kernel since 2.6. A Linux bridge is often used to set up a transparent proxy/firewall, or to work as a virtual switch which interconnects multiple virtual machines and containers created on a host.

Like a hardware Ethernet bridge, a Linux bridge comes with [MAC address learning](#) capability built-in. so that it knows how (i.e., to which port) to forward a network packet.

If you would like to **disable MAC address learning in a Linux bridge** for whatever reason, follow this tutorial.

Note that once MAC learning is turned off, a Linux bridge will flood every incoming packet to the rest of the ports. Understand this implication before proceeding.

MAC Address Learning vs. Ageing Time

When a Linux bridge receives a packet with a new source MAC address from a particular bridge port, it stores the MAC address along with the port number in its MAC learning table. A timer is associated with each entry in the table, so that the entry expires after a certain period (so-called "ageing time"), unless it is refreshed before then. By default the ageing time in a Linux bridge is set to 300 seconds.

If you want to disable MAC address learning in a Linux bridge, you need to set the "ageing time" to 0. Let's find out how you can actually do it.

Disable MAC Address Learning in a Linux Bridge from the Command Line

Without disabling MAC learning, a Linux bridge will learn and store one or more "non-local" MAC addresses in the MAC learning table. To check the current MAC learning table:

```
$ sudo brctl showmacs
```

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```
$
$ sudo brctl showmacs virbr0
port no mac addr is local? ageing timer
2 04:4b:ed:69:c5:d2 no 28.73
2 6c:71:d9:18:0f:27 no 24.62
2 80:86:f2:6a:24:67 no 1.22
2 84:a6:c8:cc:58:1c no 0.02
2 94:57:a5:90:d9:cd no 13.06
2 a4:4e:31:7b:12:4c no 4.23
2 b8:c7:5d:c7:ff:79 no 0.00
1 fe:54:00:2d:a7:7d yes 0.00
4 fe:54:00:3b:2e:73 yes 0.00
3 fe:54:00:73:e6:b5 yes 0.00
2 fe:54:00:d9:f5:9d yes 0.00
$
$
```

Learned MAC addresses

To view the current ageing time of a bridge, run:

```
$ brctl showstp
```

```
$ brctl showstp virbr0
virbr0
bridge id          8000.fe54002da77d
designated root    8000.fe54002da77d
root port         0
max age           20.00
hello time        2.00
forward delay     2.00
ageing time       300.00
hello timer       1.50
topology change timer 0.00
flags
path cost         0
bridge max age    20.00
bridge hello time 2.00
bridge forward delay 2.00
tcn timer         0.00
gc timer          291.94
```

MAC address ageing time

To turn off the bridge's MAC address learning, set its ageing time to 0 as follows.

```
$ sudo brctl setageing 0
```

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```
$
$ sudo brctl setageing virbr0 0 ← Disable MAC learning
$
$ sudo brctl showmacs virbr0
port no mac addr          is local?    ageing timer
 1   fe:54:00:2d:a7:7d     yes          0.00
 4   fe:54:00:3b:2e:73     yes          0.00
 3   fe:54:00:73:e6:b5     yes          0.00
 2   fe:54:00:d9:f5:9d     yes          0.00
$
$
```

No learned MAC address

Once MAC learning is deactivated, the bridge's MAC learning table will no longer contain any non-local MAC address.

Note that any change made with the `brctl` command (including MAC learning deactivation) does not survive reboots. If you want to turn off MAC learning permanently, read on.

Disable MAC Address Learning in a Linux Bridge Permanently

If you define a Linux bridge in </etc/network/interfaces> (e.g., on Debian-based system), add "bridge_ageing 0" under the bridge configuration. For example:

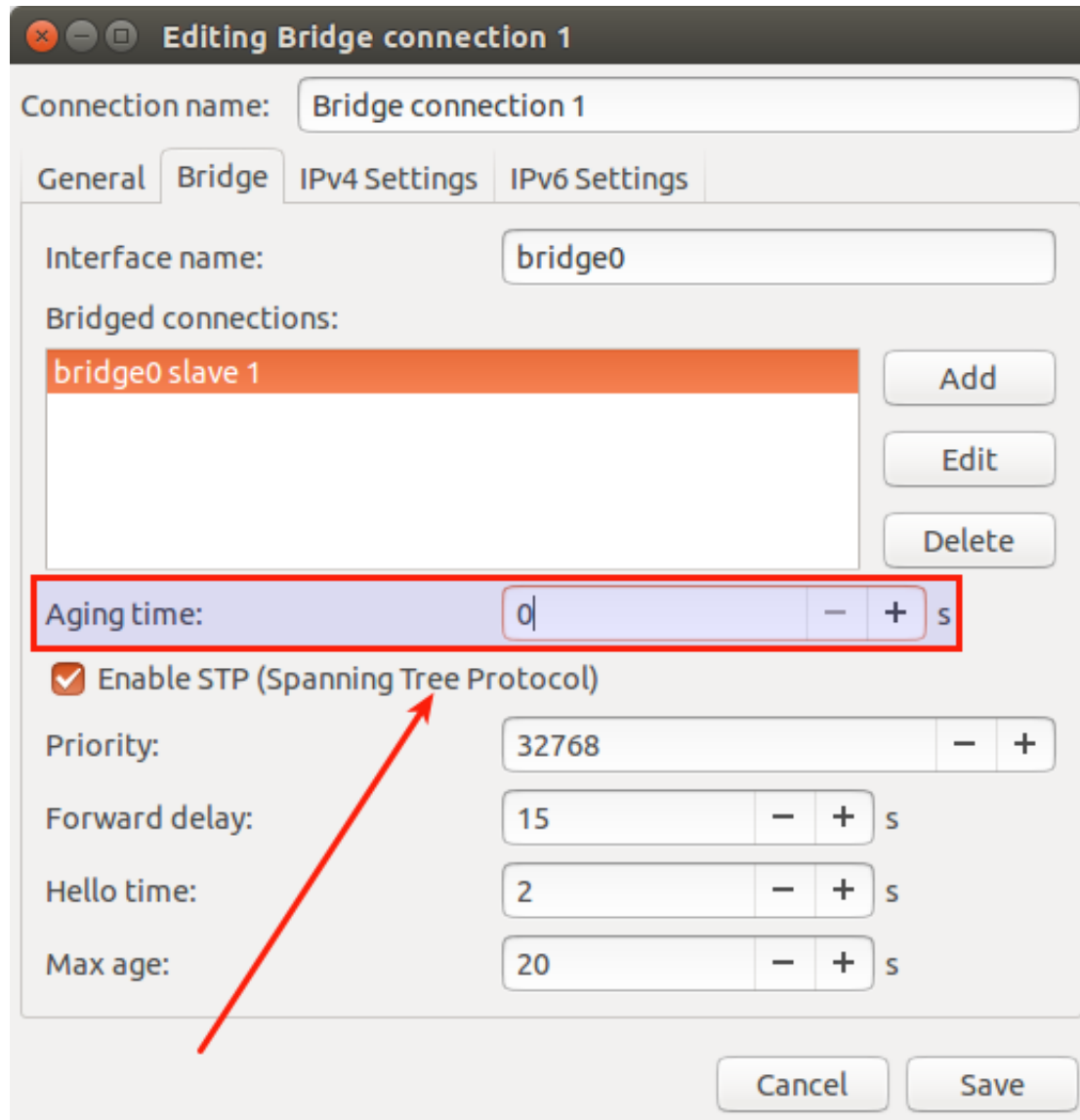
```
auto br0
iface br0 inet static
    bridge_ports eth0 eth1          bridge_ageing 0
    address 192.168.1.100          netmask 255.255.255.0          gateway 192.168.1.1
```

If you configure a Linux bridge with [Network Manager](#), set "Aging time" to 0 in the bridge editing menu.

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Editing Bridge connection 1

Connection name:

General **Bridge** IPv4 Settings IPv6 Settings

Interface name:

Bridged connections:

bridge0 slave 1	<input type="button" value="Add"/>
	<input type="button" value="Edit"/>
	<input type="button" value="Delete"/>

Aging time: s

Enable STP (Spanning Tree Protocol)

Priority:

Forward delay: s

Hello time: s

Max age: s