**Setting Kernel Parameters Persistently: RHEL 7**

Approach to set kernel parameter under RHEL 7 is a bit different than the older version. Create a new conf file under the **/etc/sysctl.d/** directory. File names take the format /etc/sysctl.d/[name].conf. Files in the /etc/sysctl.d/ directory are parsed in order so it is recommended to prepend the file name with a number signifying the order you would like the files to be parsed in. For example, /etc/sysctl.d/01-custom.conf:

* sysctl settings are defined through files in /usr/lib/sysctl.d/, /run/sysctl.d/, and /etc/sysctl.d/.
* Files in /etc/sysctl.d/ override files with the same name in /run/sysctl.d/ and /usr/lib/sysctl.d/. Files in /run/sysctl.d/ override files with the same name in /usr/lib/.
* Vendor Packages install their configuration files in /usr/lib/. Files in /etc/ are reserved for the System Admin to use this logic to override the configuration files installed by vendor packages.
* All configuration files are sorted by their filename in lexicographic order
* Multiple files specify the same option, the entry in the file with the lexicographically latest name will take precedence.
* It is recommended to prefix all filenames with a two-digit number and a dash, to simplify the ordering of the files.
* /etc/sysctl.conf file is still sourced, but via the /etc/sysctl.d/99-sysctl.conf symbolic link

# ls -ld /etc/sysctl.d/99-sysctl.conf

lrwxrwxrwx. 1 root root 14 Jun 9 2017 /etc/sysctl.d/99-sysctl.conf -> ../sysctl.conf

* So /etc/sysctl.conf will be overridden by any similay config present in any file under /etc/sysctl.d/. since 99-sysctl.conf is in last order!!
* Only changes in the **/etc/sysctl.conf** file will be applied with **#sysctl -p**

If you created some files in the **/etc/sysctl.d** directory, you will need either to type **sysctl -p /etc/sysctl.d/file.conf**(if**file.conf**is the file where kernel runtime parameters are stored) or **sysctl –system** to get the associated changes applied

**Apply settings available only when a certain module is loaded (method one)**

/etc/udev/rules.d/99-bridge.rules:

ACTION=="add", SUBSYSTEM=="module", KERNEL=="br\_netfilter", \

RUN+="/usr/lib/systemd/systemd-sysctl --prefix=/net/bridge"

/etc/sysctl.d/bridge.conf:

net.bridge.bridge-nf-call-ip6tables = 0

net.bridge.bridge-nf-call-iptables = 0

net.bridge.bridge-nf-call-arptables = 0

This method applies settings when the module is loaded. Please note that, unless the br\_netfilter module is loaded, bridged packets will not be filtered by Netfilter

**Apply settings available only when a certain module is loaded (method two)**

/etc/modules-load.d/bridge.conf:

br\_netfilter

/etc/sysctl.d/bridge.conf:

net.bridge.bridge-nf-call-ip6tables = 0

net.bridge.bridge-nf-call-iptables = 0

net.bridge.bridge-nf-call-arptables = 0

This method forces the module to be always loaded. Please note that, unless the br\_netfilter module is loaded, bridged packets will not be filtered with Netfilter (starting with kernel 3.18), so simply not loading the module is sufficient to avoid filtering.

# RHEL7: Tuning profile

RHEL 7 has a service named “**tuned**” which helps to create custom profiles and it overrides the “sysctl” values set in the /etc/sysctl.conf file, because “tuned” service will start after “sysctl” service. Use any one of the methods below to define the kernel parameters on RHEL/CentOS 7 server.

Check the active tune profile in the affected server.

# tuned-adm active

Current active profile: virtual-guest

2. Navigate to the respective tuned profile directory and verify if the problematic sysctl kernel parameter is defined with any alternate value.

# cd /usr/lib/tuned/virtual-guest

# cat tuned.conf

#

# tuned configuration

#

[main]

include=throughput-performance

[sysctl]

net.ipv4.conf.all.forwarding = 1

If yes, then there are two option to fix the incorrect sysctl kernel parameter after reboot.

a) Remove the entry in tuned profile, so that “/etc/sysctl.conf” value takes effect.

# cd /usr/lib/tuned/virtual-guest

# cat tuned.conf

#

# tuned configuration

#

[main]

include=throughput-performance

[sysctl]

b) Else, remove the entry in “/etc/sysctl.conf” which will make the tuned value persistent after reboot.

# cat /etc/sysctl.conf | grep net.ipv4.conf.all.forwarding

#

In this case, make sure you have the parameter present in the tuned profile file.

# cd /usr/lib/tuned/virtual-guest

# cat tuned.conf

#

# tuned configuration

#

[main]

include=throughput-performance

[sysctl]

net.ipv4.conf.all.forwarding = 0