

SYSTEMD is the first process which starts at boot time with PID 1. Systemd manages UNITS in RHEL.

Systemd stores its configuration in the below locations:

/etc/systemd/system/

/usr/lib/systemd/system/

Ex of UNITS :

Services, Sockets, Devices, Targets.

NOTE : Any command ends with ctl are managed by SYSTEMD.

EX:

Systemctl

Journalctl

timedatectl

hostnamectl

System targets

Targets are the system states in RHEL 7 * 8 OS. These targets states the status of an OS. In previous versions we call these targets as RUNLEVELS. From RHEL7 these runlevels are replaced with targets.

→Runlevels are managed by initd.

→System targets are managed by SYSTEMD.

```
#cd /usr/lib/systemd/system
```

```
#ls -l runlevel* |more
```

O/P

```
init 0 -->Poweroff
```

```
init 1 -->Maintenance Mode
```

```
init 2 -->Multi usermode
```

```
init 3 -->Multi usermode
```

```
init 4 -->Multi usermode
```

```
init 5 -->Multi user server mode with Graphics (Default Runlevel in Linux)
```

```
init 6 -->Reboot
```

```
#systemctl get-default (Displays your default system target)
```

Note :

The default target unit is represented by `/etc/systemd/system/default.target` file. This file is symbolic link to the current default unit.

Changing the default target :

```
#systemctl set-default multi-user.target
```

```
#systemctl get-default
```

```
#ls -l /etc/systemd/system/default.target
```

Changing currently active system target to graphical target:

```
#systemctl isolate graphical.target
```

Rebooting the Server:

```
#systemctl isolate reboot.target
```

Shutting down the server:

```
#systemctl isolate poweroff.target
```

Booting the server to maintenance mode :

```
#systemctl isolate rescue.target
```

Controlling Services using SYSTEMCTL:

```
#systemctl (Lists all the available units which are started at boot time with its status)
```

```
#systemctl --type=service (Lists status of all services)
```

Service States :

Active --> ready to use (Running)

In-Active --> Service is not running

Disabled --> Service is running may not start at boot time on it own

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Enabled ---> Service starts on its own while booting

`#systemctl status <servicename> -l` (Displays more information of a service which is in maintenance for investigation)

`#systemctl restart sshd` (stopping & starting service in 1 command)

`#systemctl reload sshd` (Issues instruction to the service to read & reload from its configuration file without stopping & starting, We should understand PID remains the same)

`#systemctl --version` (Displays the version of SYSTEMD)

NOTE :

The RHEL 7.2 release brings an upgrade of system from 208 to 219. Else as from RHEL 8 its 238.

Firewalld

It is the daemon responsible for Network Filtering in RHEL. It reads incoming network packet & filters (Allow / Deny) each data packet based on the header information in the packet. Linux OS has in-built packet filtering called NetFilter (Network-Filtering)

- In RHEL 6 we had IP Tables which is replaced with Firewalld from RHEL 7.

Configuration Options :

- 1) Runtime
- 2) Permanent

Configuration Directories:

- /usr/lib/firewalld
- /etc/firewalld

Firewalld Zones :

The firewalld service allows you to separate networks into the different zones based on the level of trust you want to place on the devices & traffic within a specific network.

For every Zone you can define the below things:

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- Services
- Ports
- Masquerading
- Port Forwarding
- ICMP Filter
- Rich Rules
- Interfaces

#firewall-cmd --list-all **(Lists the default zone and its firewall rules)**

#firewall-cmd --add-service=nfs **(Adding NFS service to the default zone)**

#firewall-cmd --remove-service=nfs **(Removing NFS service from the default zone)**

#firewall-cmd --add-port=443/tcp **(Adding port 443/tcp to the default zone)**

#firewall-cmd --add-port=443/udp **(Adding port 443/udp to the default zone)**

#firewall-cmd --remove-port=443/tcp **(Removing port 443/tcp to the default zone)**

#firewall-cmd --remove-port=443/udp **(Removing port 443/udp to the default zone)**

NOTE:

Any time you use firewall-cmd command to change any property is for run time. In order to make it permanent even after the reboot we need to use parameter “ --permanent ” while using firewall-cmd.

EX :

#firewall-cmd --permanent --add-service=ssh

#firewall-cmd --reload **(restarting Firewalld Service)**

For understanding refer the below files:

#ls -lrt /usr/lib/firewalld/zones/

#ls -l /usr/lib/firewalld/zones/public.xml

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```
#grep -i      service /usr/lib/firewalld/zones/public.xml  
#grep -i      defaultzone /etc/firewalld/firewalld.conf
```