firewalld Zone-based firewall

CONCEPTS

Without --zone, commands act on the default zone. Without --permanent, they change only the running firewall and are lost on reload or reboot.

Packet arrives on an interface or from a source
↓ matched to
Zone trust level
↓ checked against
Services, ports, rich rules allowed traffic
↓ otherwise
Zone target default: reject

Runtime and permanent are two separate configs. Test with a runtime change, then keep it with --runtime-to-permanent.

STATE AND RELOAD

`firewall-cmd --state`
Check the daemon is running

`firewall-cmd --reload`
Reload permanent config, drop runtime changes

`firewall-cmd --runtime-to-permanent`
Save runtime config as permanent

`systemctl enable --now firewalld`
Start the daemon now and at boot

ZONES

`firewall-cmd --get-zones`
List all zone names

`firewall-cmd --get-active-zones`
Zones with interfaces or sources

`firewall-cmd --get-default-zone`
Show the default zone

`firewall-cmd --set-default-zone=<zone>`
Change the default zone

`firewall-cmd --list-all`
Show a zone's full config

`firewall-cmd --zone=<zone> --list-all`
Inspect a specific zone

SERVICES AND PORTS

`firewall-cmd --add-service=<service>`
Allow a named service

`firewall-cmd --remove-service=<service>`
Stop allowing a service

`firewall-cmd --list-services`
Services allowed in a zone

`firewall-cmd --add-port=<port>/tcp`
Open a TCP port

`firewall-cmd --add-port=<from>-<to>/udp`
Open a UDP port range

`firewall-cmd --remove-port=<port>/tcp`
Close a port

`firewall-cmd --list-ports`
Ports open in a zone

`firewall-cmd --add-service=<service> --timeout=10m`
Allow temporarily, auto-revert

RICH RULES

`firewall-cmd --add-rich-rule='<rule>'`
Add a rule with conditions

`firewall-cmd --list-rich-rules`
Show rich rules in a zone

`firewall-cmd --remove-rich-rule='<rule>'`
Remove a rule, exact text

Rich rule shapes

Goal	Rule
Block a host	`rule family="ipv4" source address="<ip>" reject`
Port from subnet	`rule family="ipv4" source address="<cidr>" port port="<port>" protocol="tcp" accept`
Service with rate	`rule service name="<service>" accept limit value="1/m"`
Log then drop	`rule family="ipv4" source address="<cidr>" log prefix="fw " level="warning" drop`