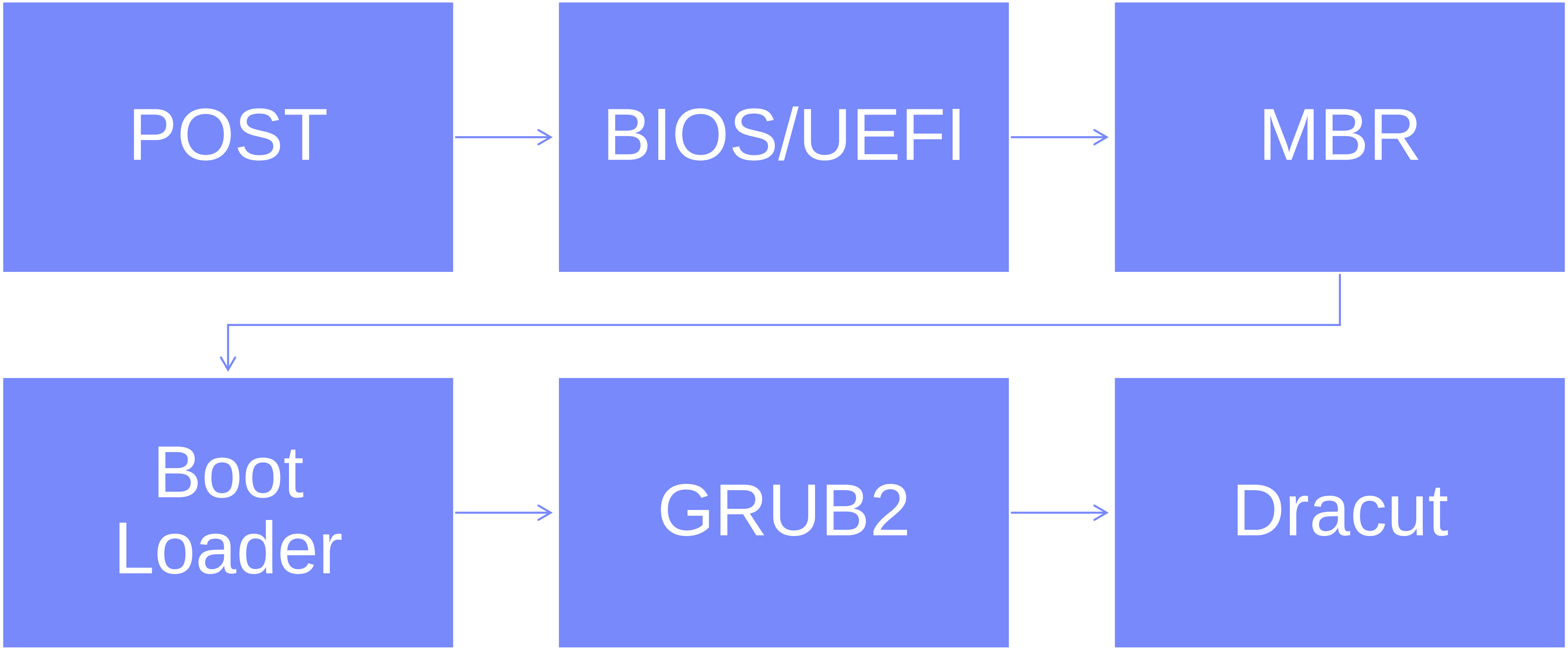
Controlling Boot Process

Unit objectives

After completing this unit, you should be able to:

- Observe old and new method in managing services
- Understand Systemd Targets and Systemd Services
- Set default target
- Troubleshoot failed services
- Manage services
- Work with systemd Units in Cockpit

Boot Sequence 1/2


POST

BIOS/UEFI

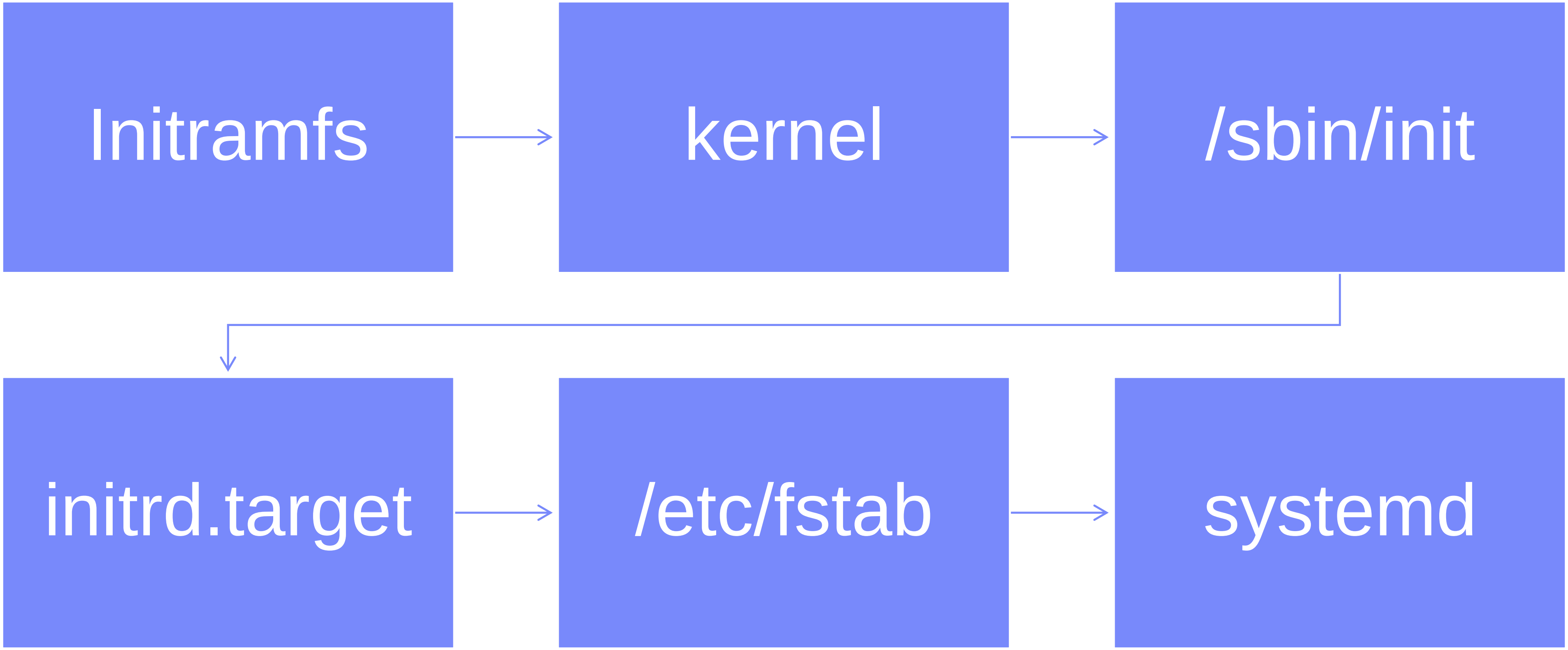
MBR

Boot Loader

GRUB2

Dracut

Boot Sequence 2/2



Initramfs

kernel

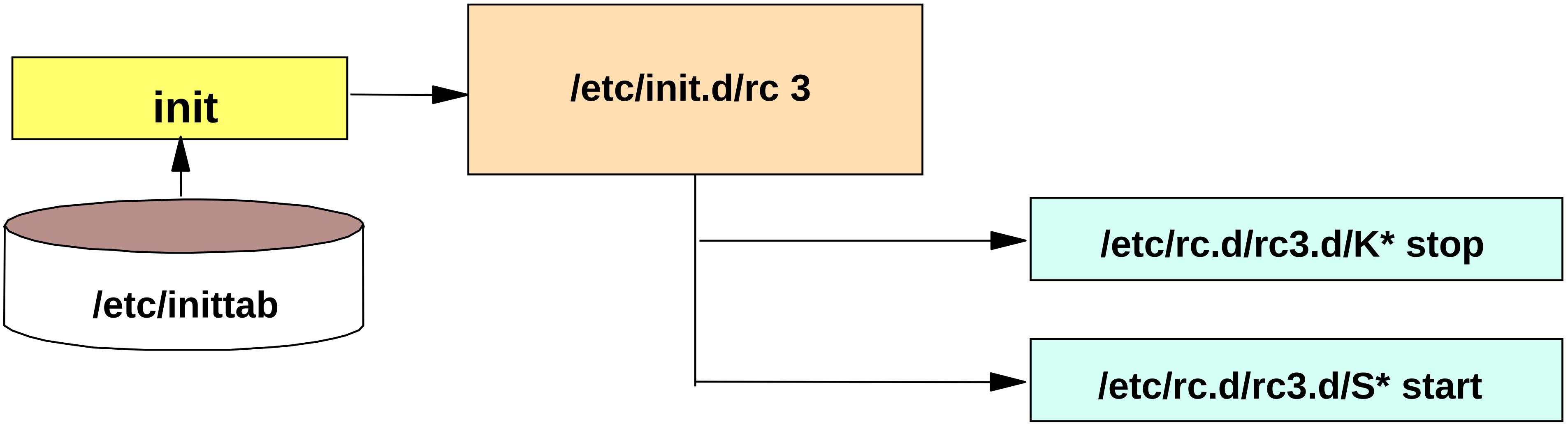
/sbin/init

initrd.target

/etc/fstab

systemd

Managing services (System V init style)

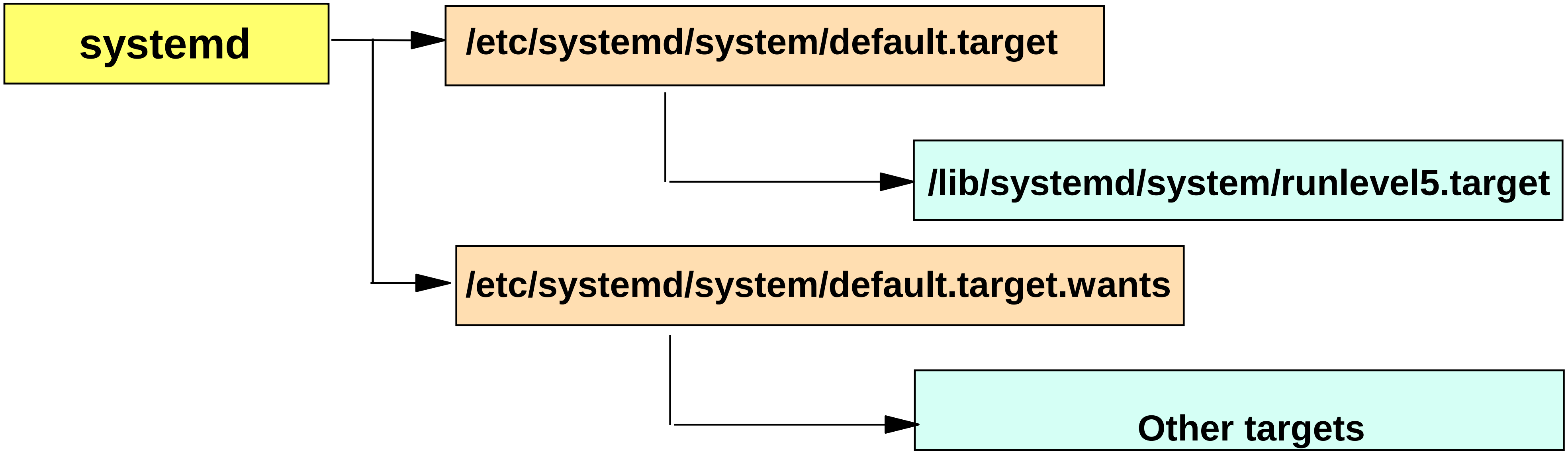


(Symlinks to the actual start/stop script)

```
# ls -l /etc/rc.d/rc3.d
lrwxrwxrwx  1 root root 24 Mar 15 10:47 K02NetworkManager ->
../init.d/NetworkManager
lrwxrwxrwx  1 root root 14 Mar 15 11:45 K05innd -> ../init.d/innd
lrwxrwxrwx  1 root root 19 Mar 15 10:45 K05saslauthd -> ../init.d/saslauthd
. . .
lrwxrwxrwx  1 root root 15 Mar 15 10:48 K15httpd -> ../init.d/httpd
lrwxrwxrwx  1 root root 15 Mar 15 11:45 K16rarpd -> ../init.d/rarpd
. . .
```

Managing services (systemd)

- Upcoming replacement for `init` in RHEL and SLES
  - Already present in Fedora 15 and OpenSUSE 11.4
- Works by defining "targets" which have other targets as dependencies
- Far less reliant on shell scripts
- Can start tasks in parallel and "on demand"
- Downwards compatible with System V init style scripts



systemd

/etc/systemd/system/default.target

/lib/systemd/system/runlevel5.target

/etc/systemd/system/default.target.wants

Other targets

Understanding Systemd Targets

- Is similar runlevel in System V
- Boot info a specific state
- Start group of services at each state
- Find default target in /etc/systemd/system
- Boot with all necessary processes / services
- Managed via
  - systemctl command
  - Cockpit web-based
  - System Management Tool

Understanding Systemd Units and Unit Type

- Query each unit with

```
# systemctl -at <unit_type>
```

Unit Type	Description
Service	Process / Daemon
Target	Group of systemd services / units
Automount	Auto-mount file system
Device	Device file recognied by kernel
Mount	File system mount point
Path	File or directory in a file system
Scope	Externally created process
Slice	Group of hierarchilly organized units that manage system processes
Socket	Inter-process communication
Swap	Swap device or swap file
Timer	Systemd timer

Starting and stopping services

- Default options: `start`, `stop`, `status`, `restart`
- Other options might also be available
- In a **systemd** environment, `service` is a wrapper for `systemctl`

```
Stop service
# systemctl stop httpd

Start service
# systemctl start httpd

Restart service
# systemctl restart httpd

Verify state of service
# systemctl status [-l] httpd
```

Enabling and Disabling services

- Start / Stop : immediate effect
- Enable / Disable : at boot time

```
Enable service
# systemctl enable httpd

Disable service
# systemctl disable httpd

Masking service – ignore start/stop/enable/disable
# systemctl mask httpd

Verify state of service
# systemctl status [-l] httpd
```

Rebooting and Shutting Down

Method	Descriptiong
systemctl poweroff	stops all running services. unmount all file systems (remount ro if cant unmount) Powers down system
systemctl reboot	poweroff > reboot
system halt	stops all running services. unmount all file systems (remount ro if cant unmount) (never power down system
poweroff	symbolic to system poweroff
reboot	symbolic to system reboot

Troubleshooting

- Services failed to start could due few reasons:
  - Configuration not valid, not complete
  - Dependent service not started
  - Check service's state → Restart service → Read logs → Reinstall software package → Enter rescue mode

```
Verify state of service
# systemctl status -l httpd

Restart service
# systemctl restart httpd

Read logs -look for errorneous message
# grep /var/logs/messages httpd

Reinstall software package
# dnf -y remove httpd; dnf -y install httpd
```

Checkpoint

1. You execute # systemctl enable sshd. But you still can't connect to the service. Why?

   a) Its not a known service

   b) The service is not started yet

   c) Firewall blocks sshd

   d) Its probably you try execute the command with non-root account

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Checkpoint

2. How do you stop the firewalld service?

a) # service stop firewalld

b) # service firewalld stop

c) # systemctl stop firewalld

d) # systemctl firewalld stop

Checkpoint

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Checkpoint

3. How do you verify the firewalld service is stopped?

a) # check status firewalld

b) # status check firewalld

c) # systemctl status firewalld

d) # systemctl verify firewalld

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Unit summary

Having completed this unit, you should be able to:

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- Set default target
- Troubleshoot failed services
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