Systemd

Symbolic links to the systemd startup configuration files are located in the /etc/systemd/system directory. Each target will have its own subdirectory as shown in Table 7-2.

Table 7-2 Systemd Target File Locations

Target	Directory
Default	/etc/systemd/system/default.target.wants
Multiuser	/etc/systemd/system/multi-user.target.wants
Network	/etc/systemd/system/network.target.wants
Sockets	/etc/systemd/system/sockets.target.wants
Sysinit	/etc/systemd/system/sysinit.target.wants

Fortunately you don't have to be a scripting/symbolic linking guru to make sure everything works right because Fedora RPM daemon packages install their files in the correct locations so that they work correctly at each target level.

When the system boots under systemd, it follows these basic steps.

1. First, systemd reads all the .target files in the /lib/systemd/system/ directory. Each target file contains a list of services that need to be run during the target activation; a list of pre-requisite targets that have to be completed and the target which must be completed immediately beforehand. In some cases the file will include targets that must be completed immediately afterwards. In this sample target file we see that the target expects the steps in sysinit.target and sockets.target to be completed as pre-requisites and that the target will also run immediately after they are completed

```
#
# File: /lib/systemd/system/basic.target
#
[Unit]
Description=Basic System
Requires=sysinit.target sockets.target
After=sysinit.target sockets.target
RefuseManualStart=yes
```

2. Using this information, systemd creates a master list of services and the order in which they should be started. The system will boot and systemd will stop starting daemons in the list after it executes the services in the default.target file found in the /etc/systemd/system directory. 3. When all this is completed without errors, the system has booted successfully.

Table 7-3 provides a summary of some important systemd commands that will be helpful to you with systemd. These are then covered in more detail.

Table 7-3 Important Systemd Boot Related Commands

Desired Result	Command
Determine the current default target group	# ll /etc/systemd/system/default.target
Determine the current active target group (Alternative method	# runlevel
Set the default target group (multi-user)	# systemctl enable multi-user.target
Change the current target group (multi-user)	# systemctl isolate multi-user.target # systemctl isolate runlevel3.target
List all active targets in the active target group	# systemctl list-units --type=target

Determine the current default target group

As stated before the target control files are located in the /etc/systemd directory tree. The file that sets the default target is /etc/systemd/system/default.target. In this case doing a directory listing of this file shows that when the system boots next, it will be in target 3.

```
[root@bigboy tmp]# ll /etc/systemd/system/default.target
lrwxrwxrwx. 1 root root 36 Jan  1  2012 /etc/systemd/system/default.target ->
/lib/systemd/system/runlevel3.target
[root@bigboy tmp]#
```

The currently running target can be determined using the runlevel command. Here we see that it is set to 3 also.

```
[root@bigboy tmp]# runlevel
N 3
[root@bigboy tmp]#
```

If you need to see all the various targets that are active then use the systemctl list-units --type=target command as shown here.

```
[root@bigboy tmp]# systemctl list-units --type=target
UNIT                 LOAD   ACTIVE SUB    JOB DESCRIPTION
basic.target         loaded active active     Basic System
cryptsetup.target    loaded active active     Encrypted Volumes
getty.target         loaded active active     Login Prompts
local-fs-pre.target loaded active active     Local File Systems (Pre)
local-fs.target      loaded active active     Local File Systems
multi-user.target    loaded active active     Multi-User
network.target       loaded active active     Network
remote-fs.target     loaded active active     Remote File Systems
sockets.target       loaded active active     Sockets
sound.target         loaded active active     Sound Card
swap.target          loaded active active     Swap
sysinit.target       loaded active active     System Initialization
syslog.target        loaded active active     Syslog

LOAD   = Reflects whether the unit definition was properly loaded.
ACTIVE = The high-level unit activation state, i.e. generalization of SUB.
SUB    = The low-level unit activation state, values depend on unit type.
JOB    = Pending job for the unit.

13 units listed. Pass --all to see inactive units, too.
[root@bigboy tmp]#
```

Set the default target group

To set the default target use either the systemctl enable x.target command or the ln -sf command to link the /lib/systemd/system/*.target file to /etc/systemd/system/default.target. In these cases we set the default target to 3 and 5.

```
[root@bigboy tmp]# systemctl enable multi-user.target

[root@bigboy tmp]# systemctl enable graphical.target
```

```
[root@bigboy tmp]# ln -sf /lib/systemd/system/multi-user.target
/etc/systemd/system/default.target

[root@bigboy tmp]# ln -sf /lib/systemd/system/graphical.target
/etc/systemd/system/default.target
```