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CentOS 7 Installation Guide on Raspberry PI

Summary: The purpose of this article is to describe how to install CentOS 7 on the Raspberry PI 3 B.

 Edit me 

Purpose

The purpose of this article is to describe how to install CentOS 7 on the Raspberry PI 3 B for use as a starting point to install light-weight services such as DNS, NTP, DHCP, Apache, etc. This guide has been tested using CentOS 7.4.1708.

Raspberry PI 3

At the cost of \$35 and an additional \$20 to \$30 in accessories the PI3 is a steal for a server providing reasonably light-weight services or workloads.

PI3 Specifications

- A 1.2GHz 64-bit quad-core ARMv8 CPU
- 802.11n Wireless LAN
- Bluetooth 4.1
- Bluetooth Low Energy (BLE)
- 1GB RAM

- 4 USB ports
- 40 GPIO pins
- Full HDMI port
- Ethernet port
- Combined 3.5mm audio jack and composite video
- Camera interface (CSI)
- Display interface (DSI)
- Micro SD card slot (now push-pull rather than push-push)
- VideoCore IV 3D graphics core

Install CentOS 7

General information

Raspberry PI SIG [↗](#)

✓ **Tip:** Root Password

The default root password is **centos**.

Media

Begin, by obtaining the CentOS media from:

<http://mirror.centos.org/altarch/7/isos/armhfp> [↗](#)

I will be using:

[CentOS-Userland-7-armv7hl-Minimal-1708-RaspberryPi3.img.xz](#) [↗](#)

Create

There are number of methods, and I found this web page on xmodulo.com to be very good.

<http://xmodulo.com/write-raspberry-pi-image-sd-card.html> [↗](#)

README

There is a `/root/README` file that describes remaining steps to complete the Raspbery PI 3 setup including how to expand the root (`/`) partition to capacity of the media. Follow the instructions to expand the root filesystem using `/usr/bin/rootfs-expand`.

```
== CentOS 7 userland ==
```

If you want to automatically resize your / partition, just type the following (as root user):

```
/usr/bin/rootfs-expand
```

Results

```
[root@centos-rpi3 ~]# /usr/bin/rootfs-expand
Extending partition 3 to max size ....
CHANGED: partition=3 start=2074624 old: size=4194304 end=6268928 new: size=60477407, end=62552031
Resizing ext4 filesystem ...
resize2fs 1.42.9 (28-Dec-2013)
Filesystem at /dev/mmcblk0p3 is mounted on /; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 4
The filesystem on /dev/mmcblk0p3 is now 7559675 blocks long.

Done.
[root@centos-rpi3 ~]# df -h /
Filesystem      Size  Used Avail Use% Mounted on
/dev/root        29G   765M   27G   3% /
```

Services

Immediately after installation, execute `systemctl` and note the two failing services `network` and `kdump`. To fix, I did the following:

network.service

Executing `systemctl start network` resulted with an error like “Failed to start LSB: Bring up/down networking.” Not terribly helpful. The solution was pretty simple, however. Execute `echo "NETWORKING=yes" > /etc/sysconfig/network` for the “network” file is absent.

kdump.service

Executing `systemctl start kdump` then `journalctl -xe` shows the message “Kdump not supported on this kernel.” Disable the service by executing `systemctl disable kdump`.

systemd-tmpfiles-setup.service

Periodically, I saw an error with `systemd-tmpfiles-setup.service`. It would come and go, so I ignored it. Further research is needed.

Disable Wifi/BT

I have no use for the wireless adapter nor bluetooth. Disabling the devices will increase security and reduce electrical / heat if not significantly.

```
[root@centos-rpi3 ~]# vi /etc/modprobe.d/raspi-blk1st.conf
```

Add

```
#wifi
blacklist brcmfmac
blacklist brcmutil

#bt
blacklist btbcm
blacklist hci_uart
```

Since I have no intention of using wireless, disable the wpa_supplicant service using `systemctl disable wpa_supplicant.service`. Using 7.4.1708 this service was not enabled.

Reference:

Disable wifi & wlan0 on PI [↗](#)

NetworkManager & firewalld

I am not a fan of NetworkManager nor firewalld on CentOS Minimal installations, so they have to go! However, we will need `iptables-services` to manage iptables in the absence of firewalld.

Disable NetworkManager & firewalld

```
[root@centos-rpi3 ~]# systemctl stop NetworkManager firewalld
[root@centos-rpi3 ~]# systemctl disable NetworkManager firewalld
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
Removed symlink /etc/systemd/system/dbus-org.freedesktop.nm-dispatcher.service.
Removed symlink /etc/systemd/system/dbus-org.freedesktop.NetworkManager.service.
Removed symlink /etc/systemd/system/multi-user.target.wants/firewalld.service.
Removed symlink /etc/systemd/system/multi-user.target.wants/NetworkManager.service.
```

Uninstall NetworkManager & firewalld

```
[root@centos-rpi3 ~]# yum remove NetworkManager NetworkManager-libnm firewalld
```

Results

Dependencies Resolved

```

=====
Package                        Arch      Version      Repository      Size
=====
Removing:
NetworkManager                armv7hl    1:1.8.0-11.el7 @updates        4.3 M
NetworkManager-libnm          armv7hl    1:1.8.0-11.el7 @updates        5.4 M
firewalld                     noarch     0.4.4.4-6.el7  @centos-base_rbf 1.8 M
Removing for dependencies:
NetworkManager-team           armv7hl    1:1.8.0-11.el7 @updates         44 k
NetworkManager-tui            armv7hl    1:1.8.0-11.el7 @updates        199 k
NetworkManager-wifi           armv7hl    1:1.8.0-11.el7 @updates        122 k

Transaction Summary
=====
Remove 3 Packages (+3 Dependent packages)

Installed size: 12 M
Is this ok [y/N]:

```

Install iptables-services

```

[root@centos-rpi3 ~]# yum install iptables-services
Loaded plugins: fastestmirror
base                                     | 3.6 kB    00:00
centos-kernel                         | 2.9 kB    00:00
extras                               | 2.9 kB    00:00
ovirt-4.1                             | 3.0 kB    00:00
updates                              | 2.9 kB    00:00
Loading mirror speeds from cached hostfile
* ovirt-4.1: resources.ovirt.org
Resolving Dependencies
--> Running transaction check
---> Package iptables-services.armv7hl 0:1.4.21-18.0.1.el7 will be installed
--> Finished Dependency Resolution

```

Dependencies Resolved

```

=====
Package                        Arch      Version      Repository      Size
=====
Installing:
iptables-services             armv7hl    1.4.21-18.0.1.el7 updates         50 k

Transaction Summary
=====
Install 1 Package

Total download size: 50 k
Installed size: 25 k
Is this ok [y/d/N]:

```

Enable iptables-services.

```
[root@centos-rpi3 ~]# systemctl enable iptables ip6tables
Created symlink from /etc/systemd/system/basic.target.wants/iptables.service to /usr/lib/systemd/system/iptables.service.
Created symlink from /etc/systemd/system/basic.target.wants/ip6tables.service to /usr/lib/systemd/system/ip6tables.service.
[root@centos-rpi3 ~]# systemctl start iptables ip6tables
```

If you reboot at this point without completing the next step, execute `dhclient` to obtain an IP address.

Network Interface

I use static IP addresses for infrastructure related services. As such, we need to update `ifcfg-eth0`.

```
[root@centos-rpi3 ~]# vi /etc/sysconfig/network-scripts/ifcfg-eth0
```

Update to reflect your IP address topology:

```
DEVICE=eth0
TYPE=Ethernet
BOOTPROTO=none
ONBOOT=yes
IPADDR=192.168.1.101
NETMASK=255.255.255.0
GATEWAY=192.168.1.254
```

Reboot or restart the network service for changes to take effect.

```
[root@centos-rpi3 ~]# systemctl restart network
```

Name Resolution

Update `resolv.conf`.

```
[root@centos-rpi3 ~]# vi /etc/resolv.conf
```

Results

```
search myhost.mydomain.net
nameserver 64.6.64.6 # Verisign: Reston, Virginia
nameserver 64.6.65.6 # Verisign: Reston, Virginia
```

Host Name

Use `hostnamectl` to set host name.

```
[root@centos-rpi3 ~]# hostnamectl set-hostname myhost.mydomain.net
[root@centos-rpi3 ~]# hostnamectl
  Static hostname: myhost.mydomain.net
        Icon name: computer
        Machine ID: c86851c595a149019a820550c3ccec08
        Boot ID: 9d27034c55c84cbda2d7dcf8f7f229e2
  Operating System: CentOS Linux 7 (Core)
        CPE OS Name: cpe:/o:centos:centos:7
        Kernel: Linux 4.9.50-v7.1.el7
  Architecture: arm
```

Restarting the `network` service will not suffice, so `reboot` to verify changes using `ping -c3 www.google.com`.

Results

```
[root@myhost ~]# ping -c3 www.google.com
PING www.google.com (172.217.5.100) 56(84) bytes of data.
64 bytes from sfo03s07-in-f4.1e100.net (172.217.5.100): icmp_seq=1 ttl=51 time=26.6 m
s
64 bytes from sfo03s07-in-f4.1e100.net (172.217.5.100): icmp_seq=2 ttl=51 time=26.7 m
s
64 bytes from sfo03s07-in-f4.1e100.net (172.217.5.100): icmp_seq=3 ttl=51 time=26.5 m
s

--- www.google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 26.594/26.682/26.765/0.201 ms
```

Time & Date

Use `timedatectl` to set time, timezone, and/or date.

```
[root@myhost ~]# timedatectl list-timezones | grep -i angeles
America/Los_Angeles
[root@myhost ~]# timedatectl set-timezone America/Los_Angeles
[root@myhost ~]# timedatectl
    Local time: Mon 2017-11-24 19:44:45 PDT
    Universal time: Tue 2017-11-25 02:44:45 UTC
    RTC time: n/a
    Time zone: America/Los_Angeles (PDT, -0700)
    NTP enabled: yes
NTP synchronized: yes
    RTC in local TZ: no
    DST active: yes
    Last DST change: DST began at
                     Sun 2016-03-13 01:59:59 PST
                     Sun 2016-03-13 03:00:00 PDT
    Next DST change: DST ends (the clock jumps one hour backwards) at
                     Sun 2016-11-06 01:59:59 PDT
                     Sun 2016-11-06 01:00:00 PST
```

yum

Check for yum update using `yum update yum`, then install preferred packages. For example, I install yum related packages and tmux.

```
[root@myhost ~]# yum install yum-utils deltarpm tmux
```

Results

```
=====
Package                Arch          Version           Repository        Size
=====
Installing:
deltarpm               armv7hl       3.6-3.el7         base              81 k
tmux                   armv7hl       1.8-4.el7         base              211 k
yum-utils              noarch        1.1.31-42.el7     base              117 k
Installing for dependencies:
libevent               armv7hl       2.0.21-4.el7      base              189 k
libxml2-python         armv7hl       2.9.1-6.el7.3     base              233 k

Transaction Summary
=====
Install 3 Packages (+2 Dependent packages)

Total download size: 832 k
Installed size: 2.9 M
Is this ok [y/d/N]:
```

Update the system. `tmux` is an alternative to `screen`. It allows reconnecting to a `tmux` session with ease when using SSH using `tmux attach`.


```
[root@myhost ~]# tmux new -s update
[root@myhost ~]# yum update -y && reboot
```

Done!?

At this point, you are ready to add repositories and install packages.

Please star to let me know you found this article useful or open an issue with questions or comments.

Have fun!

Tags:

[linux \(tag_linux.html\)](#)[centos \(tag_centos.html\)](#)[hardware \(tag_hardware.html\)](#)[sysadmin \(tag_sysadmin.html\)](#)

Comments

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alcidess [↗](#) 2018-07-12 08:44:04 [↗](#)

Excelent! Works on Banana Pi BPI-M2U

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Page last updated: November 25, 2017
Site last generated: Aug 17, 2019

