9. Package_Service Management

YUM – Yellowdog Updater, Modified-

YUM is a package management utility for RPM-based distributions. RPM (Red Hat Package Manager) is the package manager that systems like RHEL and CentOS are based on.

YUM uses RPM under the hood, hiding its complexity through a high-level abstraction.

Fedora 22 and RHEL 8 introduced a rewrite of YUM, called DNF, which is likely to become the new standard for RPM-based **systems**.

How do I check if there are any packages available for update

sudo yum check-update

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum check-update
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscript
on-manager to register.

Red Hat Enterprise Linux 8 for x86_64 - AppStre   19 kB/s |  4.5 kB    00:00
Red Hat Enterprise Linux 8 for x86_64 - BaseOS   111 kB/s |  4.1 kB    00:00
Red Hat Ansible Engine 2 for RHEL 8 (RPMs) from  102 kB/s |  4.0 kB    00:00
RHUI Client Configuration Server 8                62 kB/s |  2.0 kB    00:00

NetworkManager.x86_64            1:1.36.0-7.el8_6           rhel-8-baseos-rhui-rpms
NetworkManager-cloud-setup.x86_64
                                 1:1.36.0-7.el8_6           rhel-8-appstream-rhui-rpm
NetworkManager-libnm.x86_64 1:1.36.0-7.el8_6               rhel-8-baseos-rhui-rpms
NetworkManager-team.x86_64  1:1.36.0-7.el8_6               rhel-8-baseos-rhui-rpms
NetworkManager-tui.x86_64   1:1.36.0-7.el8_6               rhel-8-baseos-rhui-rpms
cloud-init.noarch           21.1-15.el8_6.3                rhel-8-appstream-rhui-rpm
```

How to install a particular package?

sudo yum install vsftpd -y

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum install vsftpd -y
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

Last metadata expiration check: 0:02:55 ago on Sat 09 Jul 2022 04:23:54 PM UTC.
Dependencies resolved.
================================================================================
 Package      Arch         Version         Repository                      Size
================================================================================
Installing:
 vsftpd       x86_64       3.0.3-35.el8    rhel-8-appstream-rhui-rpms      181 k

Transaction Summary
================================================================================
Install  1 Package

Total download size: 181 k
```

How to remove a particular package?

sudo yum remove vsftpd -y

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum remove vsftpd -y
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

Dependencies resolved.
================================================================================
 Package       Arch         Version             Repository                  Size
================================================================================
Removing:
 vsftpd        x86_64       3.0.3-35.el8        @rhel-8-appstream-rhui-rpms  347 k

Transaction Summary
================================================================================
Remove  1 Package
```

How to get a combined list of all the packages?

sudo yum list all

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum list all
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

Last metadata expiration check: 0:07:39 ago on Sat 09 Jul 2022 04:23:54 PM UTC.
Installed Packages
NetworkManager.x86_64                   1:1.36.0-4.el8        @System
NetworkManager-cloud-setup.x86_64       1:1.36.0-4.el8        @System
NetworkManager-libnm.x86_64             1:1.36.0-4.el8        @System
NetworkManager-team.x86_64              1:1.36.0-4.el8        @System
NetworkManager-tui.x86_64               1:1.36.0-4.el8        @System
acl.x86_64                              2.2.53-1.el8         @System
audit.x86_64                            3.0.7-2.el8.2        @System
audit-libs.x86_64                       3.0.7-2.el8.2        @System
authselect.x86_64                       1.2.2-3.el8          @System
authselect-compat.x86_64                1.2.2-3.el8          @System
authselect-libs.x86_64                  1.2.2-3.el8          @System
```

How to find out detailed information about a specific package?

sudo yum info vsftpd

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum info vsftpd
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

Last metadata expiration check: 0:15:56 ago on Sat 09 Jul 2022 04:23:54 PM UTC.
Available Packages
Name         : vsftpd
Version      : 3.0.3
Release      : 35.el8
Architecture : x86_64
Size         : 181 k
Source       : vsftpd-3.0.3-35.el8.src.rpm
Repository   : rhel-8-appstream-rhui-rpms
Summary      : Very Secure Ftp Daemon
URL          : https://security.appspot.com/vsftpd.html
License      : GPLv2 with exceptions
Description  : vsftpd is a Very Secure FTP daemon. It was written completely
             : from scratch.

[ec2-user@ip-172-31-45-115 ~]$
```

How to clear the cache information from the cache directory?

sudo yum clean all

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum clean all
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

36 files removed
[ec2-user@ip-172-31-45-115 ~]$ sudo yum info vsftpd
```

How to upgrade the system with the latest releases?

sudo yum upgrade -y

```
[root@ip-172-31-45-115 ~]# sudo yum upgrade -y
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

Last metadata expiration check: 0:06:38 ago on Sat 09 Jul 2022 04:43:34 PM UTC.
Dependencies resolved.
================================================================================
 Package            Arch    Version                Repository              Size
================================================================================
Installing:
 kernel             x86_64  4.18.0-372.13.1.el8_6  rhel-8-baseos-rhui-rpms 8.0 M
 kernel-core        x86_64  4.18.0-372.13.1.el8_6  rhel-8-baseos-rhui-rpms  39 M
 kernel-modules     x86_64  4.18.0-372.13.1.el8_6  rhel-8-baseos-rhui-rpms  32 M
Upgrading:
 NetworkManager     x86_64  1:1.36.0-7.el8_6       rhel-8-baseos-rhui-rpms 2.3 M
 NetworkManager-cloud-setup
                    x86_64  1:1.36.0-7.el8_6       rhel-8-appstream-rhui-rpms
```

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How to view the repository details/information?

sudo yum repolist all

```
[ec2-user@ip-172-31-45-115 ~]$ sudo yum repolist all
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscripti
on-manager to register.

repo id                                      repo name                    status
ansible-2-for-rhel-8-rhui-debug-rpms         Red Hat Ansible Engine 2    disabled
ansible-2-for-rhel-8-rhui-rpms               Red Hat Ansible Engine 2    enabled
ansible-2-for-rhel-8-rhui-source-rpms        Red Hat Ansible Engine 2    disabled
codeready-builder-for-rhel-8-rhui-debug-rpms Red Hat CodeReady Linux B   disabled
codeready-builder-for-rhel-8-rhui-rpms       Red Hat CodeReady Linux B   disabled
codeready-builder-for-rhel-8-rhui-source-rpms Red Hat CodeReady Linux B  disabled
rhel-8-appstream-rhui-debug-rpms             Red Hat Enterprise Linux    disabled
rhel-8-appstream-rhui-rpms                   Red Hat Enterprise Linux    enabled
rhel-8-appstream-rhui-source-rpms            Red Hat Enterprise Linux    disabled
rhel-8-baseos-rhui-debug-rpms                Red Hat Enterprise Linux    disabled
rhel-8-baseos-rhui-rpms                      Red Hat Enterprise Linux    enabled
rhel-8-baseos-rhui-source-rpms               Red Hat Enterprise Linux    disabled
rhel-8-supplementary-rhui-debug-rpms         Red Hat Enterprise Linux    disabled
```

APT – Advanced Packaging Tool

APT, on the other side, is a collection of different tools used for managing software in DPKG-based distributions.

DPKG means Debian PacKaGe and is the package manager at the core of systems like Debian and Ubuntu.

APT wraps the low-level calls to DPKG to provide the users with a user-friendly interface.

It's worthy of note that APT is an acronym used in several different contexts. It's the packaging system (APT), the Linux package under which it's distributed (apt), and also one of the tools which form the library (apt, apt-get, apt-cache, and others).

How to upgrade the system with the latest releases?

sudo apt-get update -y

```
root@ip-172-31-8-13:~# apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [1
14 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
[99.8 kB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 P
ackages [340 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd
64 Packages [141 kB]
Fetched 806 kB in 2s (487 kB/s)
Reading package lists... Done
```

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How do I check if there are any packages available for update?

sudo apt-get check

```
root@ip-172-31-8-13:~# sudo apt-get check
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
root@ip-172-31-8-13:~#
```

How to install a particular package?

sudo apt install vsftpd -y

```
root@ip-172-31-8-13:~# sudo apt install vsftpd -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  vsftpd
0 upgraded, 1 newly installed, 0 to remove and 19 not upgraded.
Need to get 123 kB of archives.
After this operation, 326 kB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 vsft
d64 3.0.5-0ubuntu1 [123 kB]
Fetched 123 kB in 1s (198 kB/s)
Preconfiguring packages ...
Selecting previously unselected package vsftpd.
(Reading database ... 93819 files and directories currently installed.)
Preparing to unpack .../vsftpd_3.0.5-0ubuntu1_amd64.deb ...
Unpacking vsftpd (3.0.5-0ubuntu1) ...
Setting up vsftpd (3.0.5-0ubuntu1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/vsftpd.service
b/systemd/system/vsftpd.service
```

How to remove a particular package?

sudo apt remove vsftpd -y

```
root@ip-172-31-8-13:~# sudo yum remove vsftpd -y
sudo: yum: command not found
root@ip-172-31-8-13:~# sudo apt remove vsftpd -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages will be REMOVED:
  vsftpd
0 upgraded, 0 newly installed, 1 to remove and 19 not upgraded.
After this operation, 326 kB disk space will be freed.
(Reading database ... 93874 files and directories currently installed.)
Removing vsftpd (3.0.5-0ubuntu1) ...
Processing triggers for man-db (2.10.2-1) ...
root@ip-172-31-8-13:~#
```

How to get a combined list of all the packages?

sudo apt list

```
jupyter/jammy 4.9.1-1 all
jupyterhub/jammy 2.0.0+ds1-2 all
jverein/jammy 2.8.18+git20200921.6212a59+dfsg-7 all
jwchat/jammy 1.0+dfsg-1.5 all
jwm/jammy 2.4.0-2 amd64
jwt/jammy 4.2.0-1 amd64
jxplorer/jammy 3.3.2+dfsg-6 all
jython-doc/jammy 2.7.2+repack1-4 all
jython-stilts/jammy 3.4.3-1 all
jython/jammy 2.7.2+repack1-4 all
jzip/jammy 210r20001005d-4build2 amd64
k2pdfopt/jammy 2.53+ds-1build1 amd64
k3b-data/jammy 21.12.3-0ubuntu1 all
k3b-extrathemes/jammy 21.12.3-0ubuntu1 all
k3b-i18n/jammy 21.12.3-0ubuntu1 all
k3b/jammy 21.12.3-0ubuntu1 amd64
k4dirstat/jammy 3.4.0-1 amd64
kaccounts-integration/jammy 4:21.12.3-0ubuntu1 amd64
kaccounts-providers/jammy 4:21.12.3-0ubuntu1 amd64
```

How to find out detailed information about a specific package?

sudo apt info vsftpd

```
root@ip-172-31-8-13:~# sudo apt info vsftpd
Package: vsftpd
Version: 3.0.5-0ubuntu1
Priority: extra
Section: net
Origin: Ubuntu
Maintainer: Ubuntu Developers <ubuntu-devel-discuss@lists.ubuntu.com>
Original-Maintainer: Keng-Yu Lin <kengyu@debian.org>
Bugs: https://bugs.launchpad.net/ubuntu/+filebug
Installed-Size: 326 kB
Provides: ftp-server
Depends: debconf (>= 0.5) | debconf-2.0, libc6 (>= 2.34), libcap2 (>= 1:2.10), 
ibpam0g (>= 0.99.7.1), libssl3 (>= 3.0.0~~alpha1), libwrap0 (>= 7.6-4~), adduser
, libpam-modules, lsb-base (>= 3.0-6), netbase, procps, sysvinit-utils (>= 2.96)
Recommends: logrotate, ssl-cert
Conflicts: ftp-server
Replaces: ftp-server
Homepage: http://vsftpd.beasts.org/
Download-Size: 123 kB
APT-Sources: http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 P
ckages
```

How to upgrade the system with the latest releases?

sudo apt upgrade -y

```
root@ip-172-31-8-13:~# sudo apt upgrade -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following NEW packages will be installed:
  linux-aws-headers-5.15.0-1014 linux-headers-5.15.0-1014-aws
  linux-image-5.15.0-1014-aws linux-modules-5.15.0-1014-aws
The following packages will be upgraded:
  apparmor isc-dhcp-client isc-dhcp-common libapparmor1 libldap-2.5-0
  libldap-common libnss-systemd libpam-systemd libsystemd0 libudev1 linux-aws
  linux-headers-aws linux-image-aws python3-software-properties
  software-properties-common systemd systemd-sysv ubuntu-advantage-tools udev
19 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 56.4 MB of archives.
After this operation, 222 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 l
ibnss-systemd amd64 249.11-0ubuntu3.4 [133 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 l
ibsystemd0 amd64 249.11-0ubuntu3.4 [316 kB]
```

How to get a combined list of all the packages?

sudo apt list –installed

```
root@ip-172-31-8-13:~# apt list --installed
Listing... Done
acpid/jammy,now 1:2.0.33-1ubuntu1 amd64 [installed]
adduser/jammy,now 3.118ubuntu5 all [installed,automatic]
amd64-microcode/jammy,now 3.20191218.1ubuntu2 amd64 [installed]
apparmor/jammy,now 3.0.4-2ubuntu2 amd64 [installed,upgradable to: 3.0.4-2ubuntu2
.1]
apport-symptoms/jammy,now 0.24 all [installed,automatic]
apport/jammy-updates,jammy-security,now 2.20.11-0ubuntu82.1 all [installed,autom
atic]
apt-utils/jammy,now 2.4.5 amd64 [installed,automatic]
apt/jammy,now 2.4.5 amd64 [installed,automatic]
base-files/jammy-updates,now 12ubuntu4.1 amd64 [installed]
base-passwd/jammy,now 3.5.52build1 amd64 [installed]
bash-completion/jammy,now 1:2.11-5ubuntu1 all [installed,automatic]
bash/jammy,now 5.1-6ubuntu1 amd64 [installed]
bc/jammy,now 1.07.1-3build1 amd64 [installed,automatic]
bcache-tools/jammy,now 1.0.8-4ubuntu3 amd64 [installed,automatic]
bind9-dnsutils/jammy-updates,jammy-security,now 1:9.18.1-1ubuntu1.1 amd64 [insta
lled,automatic]
bind9-host/jammy-updates,jammy-security,now 1:9.18.1-1ubuntu1.1 amd64 [installed
```

===

Service Management

A common task for admins is restarting services. Nearly any time admins make a change to a configuration file the related service must be restarted so it can reread the configuration file and integrate the changes.

Starting of Service

The **systemctl** command manually starts a service with the following command:

 # systemctl start {servicename}

```
root@ip-172-31-42-137:~# systemctl restart nginx
root@ip-172-31-42-137:~# systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
     Loaded: loaded (/lib/systemd/system/nginx.service; enabled; vendor preset:>
     Active: active (running) since Sun 2022-07-10 06:15:05 UTC; 12s ago
       Docs: man:nginx(8)
    Process: 2002 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_proce>
    Process: 2003 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (c>
   Main PID: 2004 (nginx)
      Tasks: 2 (limit: 1146)
     Memory: 2.5M
        CPU: 22ms
     CGroup: /system.slice/nginx.service
             ├─2004 "nginx: master process /usr/sbin/nginx -g daemon on; master>
             └─2005 "nginx: worker process" "" "" "" "" "" "" "" "" "" "" "" "" >

Jul 10 06:15:05 ip-172-31-42-137 systemd[1]: Starting A high performance web se>
Jul 10 06:15:05 ip-172-31-42-137 systemd[1]: Started A high performance web ser>
lines 1-16/16 (END)
```

Status check of service

The **systemctl** command manually check status of service with the following command:

 # systemctl status {servicename}

```
root@ip-172-31-42-137:~# systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
     Loaded: loaded (/lib/systemd/system/nginx.service; enabled; vendor preset:>
     Active: active (running) since Sun 2022-07-10 05:37:25 UTC; 32min ago
       Docs: man:nginx(8)
    Process: 1715 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_proce>
    Process: 1716 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (c>
   Main PID: 1809 (nginx)
      Tasks: 2 (limit: 1146)
     Memory: 6.1M
        CPU: 24ms
     CGroup: /system.slice/nginx.service
             ├─1809 "nginx: master process /usr/sbin/nginx -g daemon on; master>
             └─1812 "nginx: worker process" "" "" "" "" "" "" "" "" "" "" "" "" >

Jul 10 05:37:25 ip-172-31-42-137 systemd[1]: Starting A high performance web se>
Jul 10 05:37:25 ip-172-31-42-137 systemd[1]: Started A high performance web ser>
lines 1-16/16 (END)
```

Stop a service

To manually **stop** a service with systemctl, type the following:

 # systemctl stop {servicename}

```
root@ip-172-31-42-137:~# systemctl disable nginx
Synchronizing state of nginx.service with SysV service script with /lib/systemd/
systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install disable nginx
Removed /etc/systemd/system/multi-user.target.wants/nginx.service.
root@ip-172-31-42-137:~#
```

Restart a service

Instead of manually starting or restarting a service, it's faster to simply use the **restart** subcommand:

 # systemctl restart {servicename}

```
root@ip-172-31-42-137:~# systemctl restart nginx
root@ip-172-31-42-137:~# systemctl status nginx
● nginx.service - A high performance web server and a reverse proxy server
     Loaded: loaded (/lib/systemd/system/nginx.service; enabled; vendor preset:>
     Active: active (running) since Sun 2022-07-10 06:15:05 UTC; 12s ago
       Docs: man:nginx(8)
    Process: 2002 ExecStartPre=/usr/sbin/nginx -t -q -g daemon on; master_proce>
    Process: 2003 ExecStart=/usr/sbin/nginx -g daemon on; master_process on; (c>
   Main PID: 2004 (nginx)
      Tasks: 2 (limit: 1146)
     Memory: 2.5M
        CPU: 22ms
     CGroup: /system.slice/nginx.service
             ├─2004 "nginx: master process /usr/sbin/nginx -g daemon on; master>
             └─2005 "nginx: worker process" "" "" "" "" "" "" "" "" "" "" "" ""  >

Jul 10 06:15:05 ip-172-31-42-137 systemd[1]: Starting A high performance web se>
Jul 10 06:15:05 ip-172-31-42-137 systemd[1]: Started A high performance web ser>
lines 1-16/16 (END)
```

Prevent service from starting

A stopped, or disabled, service can still be started if another service calls it. To prevent a service from starting in any case, use the mask subcommand. This links the service configuration to the /dev/null file.

 # systemctl disable {servicename}

```
root@ip-172-31-42-137:~# systemctl disable nginx
Synchronizing state of nginx.service with SysV service script with /lib/systemd/
systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install disable nginx
Removed /etc/systemd/system/multi-user.target.wants/nginx.service.
root@ip-172-31-42-137:~#
```

Enable a service

Starting and stopping a service only applies to the current runtime. What if admins need to configure the service to start when the system boots? The term for that action is enable:

 # systemctl enable {servicename}

```
root@ip-172-31-42-137:~# systemctl enable nginx
Synchronizing state of nginx.service with SysV service script with /lib/systemd/
systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable nginx
root@ip-172-31-42-137:~#
```

Disable a service

Likewise, if admins need to configure a service to not start when the system boots, they can type the following command to disable the service:

 # systemctl disable {servicename}

```
root@ip-172-31-42-137:~# systemctl disable nginx
Synchronizing state of nginx.service with SysV service script with /lib/systemd/
systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install disable nginx
Removed /etc/systemd/system/multi-user.target.wants/nginx.service.
root@ip-172-31-42-137:~#
```