

# Radio Edge Cloud Release 4

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## Summary

Release 4 of the Radio Edge Cloud blueprint contains only minor changes. As of Release 3 the Radio Edge Cloud blueprint has been very stable and most of the contributors focus has been within the O-RAN community rather than Akraino with enhancements to the RAN Intelligent Controller. As in Release 3, most of the code for REC is actually shared with its Telco Appliance (TA) family. The changes to Telco Appliance are mostly the version increments to the upstream projects listed below plus minor bug fixes and the bullet points listed below. Providing an integrated, automated deployment of an interoperable set of upstream projects is a major goal of REC and TA, so these version updates are the primary focus of the release.

## Documentation Links

- [REC API Document](#)
- [REC Architecture Document](#)
- [REC Installation Guide](#)
- [REC Release Notes](#)
- [REC Test Document](#)

## Changes since Release 3 (2020-05-21)

### New Features

- Updated from pinned CentOS 7.6.1810 to latest CentOS 7 (currently 7.8.2003)
- Rebalance root disk storage - move MariaDB onto its own volume and make /var/log receive all remaining space after other partition allocations are fulfilled

### Fixes

- Security: disable kubelet debugging handlers flag
- Fix zipp version issue
- Boot fixes: on Nokia hardware, boot first from (virtual) CD-ROM rather than floppy; on Dell hardware boot first from virtual, rather than physical, CD.
- Remove deprecated XFS "nobARRIER" mount option
- BMC Exception handling

## Versions of Selected Upstream Components

- Docker 3:19.03.3
- containerd 1.2.6
- Helm 2.15.2
- Kubernetes 1.16.2
- DANM 4.1.0
- Flannel 0.11.0
- Elasticsearch 7.4.2
- Fluentd 1.7.4
- Prometheus 2.13.1

## Full Package Listing

yum list from installed REC server

```

$ yum list
Loaded plugins: fastestmirror, priorities
Installed Packages
MySQL-python.x86_64                1.2.5-1.el7 @centos-base
OpenIPMI.x86_64                    2.0.27-1.el7 @centos-base
OpenIPMI-libs.x86_64               2.0.27-1.el7 @centos-base
OpenIPMI-modalias.x86_64           2.0.27-1.el7 @centos-base
PyYAML.x86_64                      3.10-11.el7 installed
access-management.noarch           c4.g34040e0-1.el7.centos.ta @akraino-ta
acl.x86_64                         2.2.51-15.el7 installed
activators.noarch                  c35.gc8427f2-1.el7.centos.ta @akraino-ta
ansible.noarch                     2.4.4.0-1.el7.ans @centos-cloud
ansible-role-ntp.noarch            0.4.0.2.g4fc673c-1.el7.centos.ta @akraino-ta
apr.x86_64                         1.4.8-5.el7 @centos-base
apr-util.x86_64                   1.5.2-6.el7 @centos-base
audit.x86_64                      2.8.5-4.el7 installed
audit-libs.x86_64                 2.8.5-4.el7 installed
audit-libs-python.x86_64          2.8.5-4.el7 installed
authconfig.x86_64                 6.2.8-30.el7 installed
autogen-libopts.x86_64            5.18-5.el7 @centos-base
avahi-libs.x86_64                 0.6.31-20.el7 @centos-base
basesystem.noarch                 10.0-7.el7.centos installed
bash.x86_64                       4.2.46-34.el7 installed
bash-completion.noarch            1:2.1-8.el7 @centos-base
bind-export-libs.x86_64           32:9.11.4-16.P2.el7_8.6 @centos-updates
binutils.x86_64                   2.27-43.base.el7_8.1 @centos-updates
boost-program-options.x86_64      1.53.0-28.el7 @centos-base
boost159-atomic.x86_64            1.59.0-2.el7.1 @centos-cloud
boost159-chrono.x86_64            1.59.0-2.el7.1 @centos-cloud
boost159-date-time.x86_64         1.59.0-2.el7.1 @centos-cloud
boost159-filesystem.x86_64        1.59.0-2.el7.1 @centos-cloud
boost159-locale.x86_64            1.59.0-2.el7.1 @centos-cloud
boost159-log.x86_64               1.59.0-2.el7.1 @centos-cloud
boost159-program-options.x86_64   1.59.0-2.el7.1 @centos-cloud
boost159-regex.x86_64             1.59.0-2.el7.1 @centos-cloud
boost159-system.x86_64            1.59.0-2.el7.1 @centos-cloud
boost159-thread.x86_64            1.59.0-2.el7.1 @centos-cloud
btrfs-progs.x86_64                4.9.1-1.el7 installed
bzip2-libs.x86_64                 1.0.6-13.el7 installed
ca-certificates.noarch            2020.2.41-70.0.el7_8 @centos-updates
caas-chartrepo.x86_64             1.0.0-13.el7.centos.ta @akraino-ta
caas-cpupooler.x86_64             0.3.1-15.el7.centos.ta @akraino-ta
caas-custom-metrics.x86_64        0.5.0-4.el7.centos.ta @akraino-ta
caas-danm.x86_64                  4.1.0-2.el7.centos.ta @akraino-ta
caas-dynamic_local_pv_provisioner.x86_64 0.1.0-5.el7.centos.ta @akraino-ta
caas-elasticsearch.x86_64         7.4.2-0.el7.centos.ta @akraino-ta
caas-etcd.x86_64                  3.4.3-1.el7.centos.ta @akraino-ta
caas-flannel.x86_64               0.11.0-12.el7.centos.ta @akraino-ta
caas-fluentd.x86_64               1.7.4-0.el7.centos.ta @akraino-ta
caas-helm.x86_64                  2.15.2-1.el7.centos.ta @akraino-ta
caas-hyperdanm.x86_64             4.1.0-2.el7.centos.ta @akraino-ta
caas-infra-charts.noarch          1.0.0-49.el7.centos.ta @akraino-ta
caas-instantiate.noarch           1.0.0-25.el7.centos.ta @akraino-ta
caas-kubedns.x86_64               1.15.7-1.el7.centos.ta @akraino-ta
caas-kubernetes.x86_64            1.16.2-4.el7.centos.ta @akraino-ta
caas-lcm.x86_64                   1.0.0-9.el7.centos.ta @akraino-ta
caas-logging.noarch               c20.g6b5969e-1.el7.centos.ta @akraino-ta
caas-metrics_server.x86_64        0.3.6-0.el7.centos.ta @akraino-ta
caas-prometheus.x86_64            2.13.1-0.el7.centos.ta @akraino-ta
caas-registry.x86_64              2.7.1-12.el7.centos.ta @akraino-ta
caas-security.x86_64              1.0.0-11.el7.centos.ta @akraino-ta
caas-sriovdp.x86_64               3.1.0-1.el7.centos.ta @akraino-ta
caas-storage_local_static_provisioner.x86_64 2.3.3-1.el7.centos.ta @akraino-ta
caas-swift.x86_64                 2.23.1-1.el7.centos.ta @akraino-ta
caas-utils.noarch                 1.0.0-11.el7.centos.ta @akraino-ta
centos-indexhtml.noarch           7-9.el7.centos @centos-base
centos-logos.noarch               70.0.6-3.el7.centos @centos-base
centos-release.x86_64             7-8.2003.0.el7.centos installed
ceph.x86_64                       2:12.2.11-0.el7 @centos-ceph
ceph-ansible.noarch               3.1.10-1.el7 @centos-ceph
ceph-base.x86_64                  2:12.2.11-0.el7 @centos-ceph

```

ceph-common.x86_64	2:12.2.11-0.el7	@centos-ceph
ceph-mds.x86_64	2:12.2.11-0.el7	@centos-ceph
ceph-mgr.x86_64	2:12.2.11-0.el7	@centos-ceph
ceph-mon.x86_64	2:12.2.11-0.el7	@centos-ceph
ceph-osd.x86_64	2:12.2.11-0.el7	@centos-ceph
ceph-radosgw.x86_64	2:12.2.11-0.el7	@centos-ceph
ceph-selinux.x86_64	2:12.2.11-0.el7	@centos-ceph
checkpolicy.x86_64	2.5-8.el7	installed
chkconfig.x86_64	1.7.4-1.el7	installed
cloud-init.x86_64	18.5-6.el7.centos.5	@centos-updates
cloud-utils.x86_64	0.27-20.el7.centos	@centos-extras
cloud-utils-growpart.noarch	0.29-5.el7	installed
config-encoder-macros.noarch	master.624ed05-1.el7.centos.ta	@akraino-ta
config-manager.noarch	c36.g8a3f88d-1.el7.centos.ta	@akraino-ta
container-selinux.noarch	2:2.119.2-1.911c772.el7_8	@centos-extras
containerd.io.x86_64	1.2.6-3.3.el7	@docker-ce-stable
coreutils.x86_64	8.22-24.el7	installed
cpio.x86_64	2.11-27.el7	installed
cpp-hocon.x86_64	0.1.6-9.el7	@centos-cloud
cracklib.x86_64	2.9.0-11.el7	installed
cracklib-dicts.x86_64	2.9.0-11.el7	installed
cronie.x86_64	1.4.11-23.el7	installed
cronie-anacron.x86_64	1.4.11-23.el7	installed
crontabs.noarch	1.11-6.20121102git.el7	installed
cryptsetup.x86_64	2.0.3-6.el7	@centos-base
cryptsetup-libs.x86_64	2.0.3-6.el7	installed
curl.x86_64	7.29.0-57.el7_8.1	@centos-updates
cyrus-sasl.x86_64	2.1.26-23.el7	@centos-base
cyrus-sasl-gssapi.x86_64	2.1.26-23.el7	@centos-base
cyrus-sasl-lib.x86_64	2.1.26-23.el7	installed
dbus.x86_64	1:1.10.24-14.el7_8	@centos-updates
dbus-glib.x86_64	0.100-7.el7	installed
dbus-libs.x86_64	1:1.10.24-14.el7_8	@centos-updates
dbus-python.x86_64	1.1.1-9.el7	installed
dejavu-fonts-common.noarch	2.33-6.el7	@centos-base
dejavu-sans-fonts.noarch	2.33-6.el7	@centos-base
device-mapper.x86_64	7:1.02.164-7.el7_8.2	@centos-updates
device-mapper-event.x86_64	7:1.02.164-7.el7_8.2	@centos-updates
device-mapper-event-libs.x86_64	7:1.02.164-7.el7_8.2	@centos-updates
device-mapper-libs.x86_64	7:1.02.164-7.el7_8.2	@centos-updates
device-mapper-multipath-libs.x86_64	0.4.9-131.el7	@centos-base
device-mapper-persistent-data.x86_64	0.8.5-2.el7	@centos-base
dhclient.x86_64	12:4.2.5-79.el7.centos	installed
dhcp-common.x86_64	12:4.2.5-79.el7.centos	installed
dhcp-libs.x86_64	12:4.2.5-79.el7.centos	installed
dialog.x86_64	1.2-5.20130523.el7	@centos-base
diffutils.x86_64	3.3-5.el7	installed
distributed-state-server.noarch	c2.gbd5a0a1-1.el7.centos.ta	@akraino-ta
dmidecode.x86_64	1:3.2-3.el7	installed
dnsmasq.x86_64	2.76-10.el7_7.1	@centos-base
docker-ce.x86_64	3:19.03.3-3.el7	@docker-ce-stable
docker-ce-cli.x86_64	1:19.03.3-3.el7	@docker-ce-stable
dosfstools.x86_64	3.0.20-10.el7	@centos-base
dpdk.x86_64	18.11.8-1.el7_8	@centos-extras
dpdk-tools.x86_64	18.11.8-1.el7_8	@centos-extras
dracut.x86_64	033-568.el7	installed
dracut-config-generic.x86_64	033-568.el7	installed
dracut-config-rescue.x86_64	033-568.el7	installed
dracut-network.x86_64	033-568.el7	installed
driverctl.noarch	0.108-1.el7_6	@centos-extras
e2fsprogs.x86_64	1.42.9-17.el7	installed
e2fsprogs-libs.x86_64	1.42.9-17.el7	installed
elfutils-default-yama-scope.noarch	0.176-4.el7	installed
elfutils-libelf.x86_64	0.176-4.el7	installed
elfutils-libs.x86_64	0.176-4.el7	installed
erlang-asn1.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-compiler.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-crypto.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-eldap.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-erts.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-hipe.x86_64	19.3.6.4-1.el7	@centos-cloud

erlang-inets.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-kernel.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-mnesia.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-os_mon.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-otp_mibs.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-public_key.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-runtime_tools.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-sasl.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-sd_notify.x86_64	1.0-2.el7	@centos-cloud
erlang-snmp.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-ssl.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-stdlib.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-syntax_tools.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-tools.x86_64	19.3.6.4-1.el7	@centos-cloud
erlang-xmerl.x86_64	19.3.6.4-1.el7	@centos-cloud
etcd.x86_64	3.3.11-2.el7.centos	@centos-extras
ethhtool.x86_64	2:4.8-10.el7	installed
euca2ools.noarch	3.4.1-1.el7	@epel
expat.x86_64	2.1.0-11.el7	installed
factor.x86_64	1:3.9.3-7.el7	@centos-cloud
file.x86_64	5.11-36.el7	installed
file-libs.x86_64	5.11-36.el7	installed
filesystem.x86_64	3.2-25.el7	installed
findutils.x86_64	1:4.5.11-6.el7	installed
fipscheck.x86_64	1.4.1-6.el7	installed
fipscheck-lib.x86_64	1.4.1-6.el7	installed
fontconfig.x86_64	2.13.0-4.3.el7	@centos-base
fontpackages-filesystem.noarch	1.44-8.el7	@centos-base
freetype.x86_64	2.8-14.el7	installed
fuse-libs.x86_64	2.9.2-11.el7	@centos-base
galera.x86_64	25.3.16-3.el7	@centos-cloud
gawk.x86_64	4.0.2-4.el7_3.1	installed
gd.x86_64	2.0.35-26.el7	@centos-base
gdbm.x86_64	1.10-8.el7	installed
gdisk.x86_64	0.8.10-3.el7	@centos-base
genisoimage.x86_64	1.1.11-25.el7	@centos-base
gettext.x86_64	0.19.8.1-3.el7	installed
gettext-libs.x86_64	0.19.8.1-3.el7	installed
git.x86_64	1.8.3.1-23.el7_8	@centos-updates
glib2.x86_64	2.56.1-5.el7	installed
glibc.x86_64	2.17-307.el7.1	installed
glibc-common.x86_64	2.17-307.el7.1	installed
glusterfs.x86_64	6.0-29.el7	@centos-base
glusterfs-api.x86_64	6.0-29.el7	@centos-base
glusterfs-client-xlators.x86_64	6.0-29.el7	@centos-base
glusterfs-libs.x86_64	6.0-29.el7	@centos-base
gmp.x86_64	1:6.0.0-15.el7	installed
gnupg2.x86_64	2.0.22-5.el7_5	installed
gnutls.x86_64	3.3.29-9.el7_6	@centos-base
gobject-introspection.x86_64	1.56.1-1.el7	installed
gperftools-libs.x86_64	2.6.1-1.el7	@centos-base
gpgme.x86_64	1.3.2-5.el7	installed
gpm-libs.x86_64	1.20.7-6.el7	@centos-base
grep.x86_64	2.20-3.el7	installed
groff-base.x86_64	1.22.2-8.el7	installed
grub2.x86_64	1:2.02-0.86.el7.centos	@centos-updates
grub2-common.noarch	1:2.02-0.86.el7.centos	@centos-updates
grub2-pc.x86_64	1:2.02-0.86.el7.centos	@centos-updates
grub2-pc-modules.noarch	1:2.02-0.86.el7.centos	@centos-updates
grub2-tools.x86_64	1:2.02-0.86.el7.centos	@centos-updates
grub2-tools-extra.x86_64	1:2.02-0.86.el7.centos	@centos-updates
grub2-tools-minimal.x86_64	1:2.02-0.86.el7.centos	@centos-updates
grubby.x86_64	8.28-26.el7	installed
gssproxy.x86_64	0.7.0-28.el7	installed
gzip.x86_64	1.5-10.el7	installed
haproxy.x86_64	1.5.18-9.el7	@centos-base
hardlink.x86_64	1:1.0-19.el7	installed
hostcli.noarch	c2.g9a52ce0-1.el7.centos.ta	@akraino-ta
hostname.x86_64	3.13-3.el7_7.1	installed
httpd.x86_64	2.4.6-93.el7.centos	@centos-base
httpd-tools.x86_64	2.4.6-93.el7.centos	@centos-base

hw-detector.noarch	c7.gd3defb5-1.el7.centos.ta	@akraino-ta
hwdata.x86_64	0.252-9.5.el7	installed
image-provision.noarch	c7.g9ae9036-1.el7.centos.ta	@akraino-ta
info.x86_64	5.1-5.el7	installed
infra-ansible.noarch	c41.g76de2b3-1.el7.centos.ta	@akraino-ta
initscripts.x86_64	9.49.49-1.el7	installed
inventoryhandlers.noarch	c35.gc8427f2-1.el7.centos.ta	@akraino-ta
ipa-deployer.x86_64	c7.gd881d27-1.el7.centos.ta	@akraino-ta
ipmitool.x86_64	1.8.18-9.el7_7	@centos-updates
iproute.x86_64	4.11.0-25.el7_7.2	installed
ipset-libs.x86_64	7.1-1.el7	@centos-base
iptables.x86_64	1.4.21-34.el7	installed
iptables-services.x86_64	1.4.21-34.el7	@centos-base
iputils.x86_64	20160308-10.el7	installed
ironic-virtmedia-driver.noarch	c8.g9b864a4-1.el7.centos.ta	@akraino-ta
irqbalance.x86_64	3:1.0.7-12.el7	installed
iscsi-initiator-utils.x86_64	6.2.0.874-17.el7	@centos-base
iscsi-initiator-utils-iscsiuio.x86_64	6.2.0.874-17.el7	@centos-base
jansson.x86_64	2.10-1.el7	installed
jemalloc.x86_64	3.6.0-1.el7	@centos-cloud
jq.x86_64	1.6-2.el7	@epel
json-c.x86_64	0.11-4.el7_0	installed
kbd.x86_64	1.15.5-15.el7	installed
kbd-legacy.noarch	1.15.5-15.el7	installed
kbd-misc.noarch	1.15.5-15.el7	installed
keepalived.x86_64	1.3.5-16.el7	@centos-base
kernel.x86_64	5.4.65-200.el7	@centos-altarch
kernel-core.x86_64	5.4.65-200.el7	@centos-altarch
kernel-modules.x86_64	5.4.65-200.el7	@centos-altarch
kernel-tools.x86_64	5.4.65-200.el7	@centos-altarch
kernel-tools-libs.x86_64	5.4.65-200.el7	@centos-altarch
kexec-tools.x86_64	2.0.15-43.el7	installed
keyutils.x86_64	1.5.8-3.el7	installed
keyutils-libs.x86_64	1.5.8-3.el7	installed
keyutils-libs-devel.x86_64	1.5.8-3.el7	@centos-base
kmod.x86_64	20-28.el7	installed
kmod-libs.x86_64	20-28.el7	installed
kpartx.x86_64	0.4.9-131.el7	installed
krb5-devel.x86_64	1.15.1-46.el7	@centos-base
krb5-libs.x86_64	1.15.1-46.el7	installed
leatherman.x86_64	1.3.0-9.el7	@centos-cloud
less.x86_64	458-9.el7	installed
leveldb.x86_64	1.12.0-11.el7	@epel
libX11.x86_64	1.6.7-2.el7	@centos-base
libX11-common.noarch	1.6.7-2.el7	@centos-base
libXau.x86_64	1.0.8-2.1.el7	@centos-base
libXpm.x86_64	3.5.12-1.el7	@centos-base
libacl.x86_64	2.2.51-15.el7	installed
libaio.x86_64	0.3.109-13.el7	@centos-base
libassuan.x86_64	2.1.0-3.el7	installed
libattr.x86_64	2.4.46-13.el7	installed
libbabeltrace.x86_64	1.2.4-3.1.el7	@centos-ceph
libbasicobjects.x86_64	0.1.1-32.el7	installed
libblkid.x86_64	2.23.2-63.el7	installed
libcap.x86_64	2.22-11.el7	installed
libcap-ng.x86_64	0.7.5-4.el7	installed
libcephfs2.x86_64	2:12.2.11-0.el7	@centos-ceph
libcgrouper.x86_64	0.41-21.el7	installed
libcollection.x86_64	0.7.0-32.el7	installed
libcom_err.x86_64	1.42.9-17.el7	installed
libcom_err-devel.x86_64	1.42.9-17.el7	@centos-base
libcroco.x86_64	0.6.12-4.el7	installed
libcurl.x86_64	7.29.0-57.el7_8.1	@centos-updates
libdaemon.x86_64	0.14-7.el7	installed
libdb.x86_64	5.3.21-25.el7	installed
libdb-utils.x86_64	5.3.21-25.el7	installed
libedit.x86_64	3.0-12.20121213cvs.el7	installed
libestr.x86_64	0.1.9-2.el7	installed
libevent.x86_64	2.0.21-4.el7	installed
libfastjson.x86_64	0.99.4-3.el7	installed
libffi.x86_64	3.0.13-19.el7	installed

libgcc.x86_64	4.8.5-39.el7	installed
libgcrypt.x86_64	1.5.3-14.el7	installed
libgomp.x86_64	4.8.5-39.el7	installed
libgpg-error.x86_64	1.12-3.el7	installed
libibverbs.x86_64	22.4-4.el7_8	@centos-updates
libicu.x86_64	50.2-4.el7_7	@centos-updates
libidn.x86_64	1.28-4.el7	installed
libini_config.x86_64	1.3.1-32.el7	installed
libiscsi.x86_64	1.9.0-7.el7	@centos-base
libjpeg-turbo.x86_64	1.2.90-8.el7	@centos-base
libkadm5.x86_64	1.15.1-46.el7	@centos-base
libmnl.x86_64	1.0.3-7.el7	installed
libmount.x86_64	2.23.2-63.el7	installed
libndp.x86_64	1.2-9.el7	installed
libnetfilter_conntrack.x86_64	1.0.6-1.el7_3	installed
libnfnetwork.x86_64	1.0.1-4.el7	installed
libnfsidmap.x86_64	0.25-19.el7	installed
libnl3.x86_64	3.2.28-4.el7	installed
libnl3-cli.x86_64	3.2.28-4.el7	installed
libpath_utils.x86_64	0.2.1-32.el7	installed
libpcap.x86_64	14:1.5.3-12.el7	@centos-base
libpipeline.x86_64	1.2.3-3.el7	installed
libpng.x86_64	2:1.5.13-7.el7_2	installed
libpwquality.x86_64	1.2.3-5.el7	installed
librados2.x86_64	2:12.2.11-0.el7	@centos-ceph
libradosstriper1.x86_64	2:12.2.11-0.el7	@centos-ceph
librbd1.x86_64	2:12.2.11-0.el7	@centos-ceph
libref_array.x86_64	0.1.5-32.el7	installed
librgw2.x86_64	2:12.2.11-0.el7	@centos-ceph
libseccomp.x86_64	2.3.1-4.el7	installed
libselinux.x86_64	2.5-15.el7	installed
libselinux-devel.x86_64	2.5-15.el7	@centos-base
libselinux-python.x86_64	2.5-15.el7	installed
libselinux-utils.x86_64	2.5-15.el7	installed
libsemanage.x86_64	2.5-14.el7	installed
libsemanage-python.x86_64	2.5-14.el7	installed
libsepol.x86_64	2.5-10.el7	installed
libsepol-devel.x86_64	2.5-10.el7	@centos-base
libsmartcols.x86_64	2.23.2-63.el7	installed
libss.x86_64	1.42.9-17.el7	installed
libssh2.x86_64	1.8.0-3.el7	installed
libstdc++.x86_64	4.8.5-39.el7	installed
libsysfs.x86_64	2.1.0-16.el7	installed
libtasn1.x86_64	4.10-1.el7	installed
libteam.x86_64	1.29-1.el7	installed
libtirpc.x86_64	0.2.4-0.16.el7	installed
libtomcrypt.x86_64	1.17-33.20170623gitcd6e602.el7	@centos-cloud
libtommath.x86_64	1.0-8.el7	@centos-cloud
libunistring.x86_64	0.9.3-9.el7	installed
libusal.x86_64	1.1.11-25.el7	@centos-base
libuser.x86_64	0.60-9.el7	installed
libutempter.x86_64	1.1.6-4.el7	installed
libuuid.x86_64	2.23.2-63.el7	installed
libverto.x86_64	0.2.5-4.el7	installed
libverto-devel.x86_64	0.2.5-4.el7	@centos-base
libverto-libevent.x86_64	0.2.5-4.el7	installed
libvirt-libs.x86_64	4.5.0-33.el7_8.1	@centos-updates
libvirt-python.x86_64	4.5.0-1.el7	@centos-base
libxcb.x86_64	1.13-1.el7	@centos-base
libxml2.x86_64	2.9.1-6.el7.4	installed
libxml2-python.x86_64	2.9.1-6.el7.4	installed
libxslt.x86_64	1.1.28-5.el7	@centos-base
libyaml.x86_64	0.1.4-11.el7_0	installed
linux-firmware.noarch	20191203-76.git8a0f4c.el7	@centos-base
lksctp-tools.x86_64	1.0.17-2.el7	@centos-base
lm_sensors-libs.x86_64	3.4.0-8.20160601gitf9185e5.el7	@centos-base
lockcli.noarch	c3.g54aed66-1.el7.centos.ta	@akraino-ta
logrotate.x86_64	3.8.6-19.el7	installed
lshw.x86_64	B.02.18-14.el7	installed
lsof.x86_64	4.87-6.el7	@centos-base
lttng-ust.x86_64	2.10.0-1.el7	@centos-ceph

lua.x86_64	5.1.4-15.el7	installed
lvm2.x86_64	7:2.02.186-7.el7_8.2	@centos-updates
lvm2-libs.x86_64	7:2.02.186-7.el7_8.2	@centos-updates
lz4.x86_64	1.7.5-3.el7	installed
lzo.x86_64	2.06-8.el7	installed
m2crypto.x86_64	0.21.1-17.el7	@centos-base
mailcap.noarch	2.1.41-2.el7	@centos-base
make.x86_64	1:3.82-24.el7	installed
man-db.x86_64	2.6.3-11.el7	installed
mariadb.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-common.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-config.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-devel.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-errmsg.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-libs.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-server.x86_64	3:10.1.1.20-2.el7	@centos-cloud
mariadb-server-galera.x86_64	3:10.1.1.20-2.el7	@centos-cloud
memcached.x86_64	1.5.6-1.el7	@centos-cloud
mod_wsgi.x86_64	3.4-18.el7	@centos-base
monitoring.noarch	c3.g6ee5a86-1.el7.centos.ta	@akraino-ta
mozjs17.x86_64	17.0.0-20.el7	installed
ncurses.x86_64	5.9-14.20130511.el7_4	installed
ncurses-base.noarch	5.9-14.20130511.el7_4	installed
ncurses-libs.x86_64	5.9-14.20130511.el7_4	installed
net-snmp-agent-libs.x86_64	1:5.7.2-48.el7_8.1	@centos-updates
net-snmp-libs.x86_64	1:5.7.2-48.el7_8.1	@centos-updates
net-tools.x86_64	2.0-0.25.20131004git.el7	installed
nettle.x86_64	2.7.1-8.el7	@centos-base
newt.x86_64	0.52.15-4.el7	installed
newt-python.x86_64	0.52.15-4.el7	installed
nginx.x86_64	1:1.16.1-2.el7	@epel
nginx-all-modules.noarch	1:1.16.1-2.el7	@epel
nginx-filesystem.noarch	1:1.16.1-2.el7	@epel
nginx-mod-http-image-filter.x86_64	1:1.16.1-2.el7	@epel
nginx-mod-http-perl.x86_64	1:1.16.1-2.el7	@epel
nginx-mod-http-xslt-filter.x86_64	1:1.16.1-2.el7	@epel
nginx-mod-mail.x86_64	1:1.16.1-2.el7	@epel
nginx-mod-stream.x86_64	1:1.16.1-2.el7	@epel
nmap-ncat.x86_64	2:6.40-19.el7	@centos-base
nspr.x86_64	4.21.0-1.el7	installed
nss.x86_64	3.44.0-7.el7_7	installed
nss-pem.x86_64	1.0.3-7.el7	installed
nss-softokn.x86_64	3.44.0-8.el7_7	installed
nss-softokn-freebl.x86_64	3.44.0-8.el7_7	installed
nss-sysinit.x86_64	3.44.0-7.el7_7	installed
nss-tools.x86_64	3.44.0-7.el7_7	installed
nss-util.x86_64	3.44.0-4.el7_7	installed
ntp.x86_64	4.2.6p5-29.el7.centos.2	@centos-updates
ntpdate.x86_64	4.2.6p5-29.el7.centos.2	@centos-updates
numactl-libs.x86_64	2.0.12-5.el7	installed
oniguruma.x86_64	6.8.2-1.el7	@epel
openldap.x86_64	2.4.44-21.el7_6	installed
openssh.x86_64	7.4p1-21.el7	installed
openssh-clients.x86_64	7.4p1-21.el7	installed
openssh-server.x86_64	7.4p1-21.el7	installed
openssl.x86_64	1:1.0.2k-19.el7	installed
openssl-devel.x86_64	1:1.0.2k-19.el7	@centos-base
openssl-libs.x86_64	1:1.0.2k-19.el7	installed
openstack-ansible.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-galera_client.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-galera_server.noarch	17.0.2-1.el7.centos.ta.2	@akraino-ta
openstack-ansible-haproxy_server.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-memcached_server.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-openstack_openrc.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-os_ironic.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-os_keystone.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-plugins.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-rabbitmq_server.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ansible-rsyslog_client.noarch	17.0.2-1.el7.centos.ta.1	@akraino-ta
openstack-ironic-api.noarch	1:10.1.4-1.el7.centos.ta.2	@akraino-ta
openstack-ironic-common.noarch	1:10.1.4-1.el7.centos.ta.2	@akraino-ta

openstack-ironic-conductor.noarch	1:10.1.4-1.el7.centos.ta.2	@akraino-ta
openstack-ironic-inspector.noarch	7.2.4-1.el7	@centos-cloud
openstack-keystone.noarch	1:13.0.4-1.el7	@centos-cloud
openvswitch.x86_64	1:2.11.0-4.el7	@centos-cloud
os-net-config.noarch	10.4.1-0.20191003.14e46a5.el7.centos.ta.1	@akraino-ta
os-prober.x86_64	1.58-9.el7	installed
pll-kit.x86_64	0.23.5-3.el7	installed
pll-kit-trust.x86_64	0.23.5-3.el7	installed
pam.x86_64	1.1.8-23.el7	installed
parted.x86_64	3.1-32.el7	installed
partfs_rootdisk.noarch	c6.gbf14d32-1.el7.centos.ta	@akraino-ta
passwd.x86_64	0.79-6.el7	installed
pciutils.x86_64	3.5.1-3.el7	@centos-base
pciutils-libs.x86_64	3.5.1-3.el7	installed
pcre.x86_64	8.32-17.el7	installed
pcre-devel.x86_64	8.32-17.el7	@centos-base
perl.x86_64	4:5.16.3-295.el7	@centos-base
perl-Carp.noarch	1.26-244.el7	@centos-base
perl-Compress-Raw-Bzip2.x86_64	2.061-3.el7	@centos-base
perl-Compress-Raw-Zlib.x86_64	1:2.061-4.el7	@centos-base
perl-DBD-MySQL.x86_64	4.023-6.el7	@centos-base
perl-DBI.x86_64	1.627-4.el7	@centos-base
perl-Data-Dumper.x86_64	2.145-3.el7	@centos-base
perl-Encode.x86_64	2.51-7.el7	@centos-base
perl-Error.noarch	1:0.17020-2.el7	@centos-base
perl-Exporter.noarch	5.68-3.el7	@centos-base
perl-File-Path.noarch	2.09-2.el7	@centos-base
perl-File-Temp.noarch	0.23.01-3.el7	@centos-base
perl-Filter.x86_64	1.49-3.el7	@centos-base
perl-Getopt-Long.noarch	2.40-3.el7	@centos-base
perl-Git.noarch	1.8.3.1-23.el7_8	@centos-updates
perl-HTTP-Tiny.noarch	0.033-3.el7	@centos-base
perl-IO-Compress.noarch	2.061-2.el7	@centos-base
perl-Net-Daemon.noarch	0.48-5.el7	@centos-base
perl-PathTools.x86_64	3.40-5.el7	@centos-base
perl-PlRPC.noarch	0.2020-14.el7	@centos-base
perl-Pod-Escapes.noarch	1:1.04-295.el7	@centos-base
perl-Pod-Perldoc.noarch	3.20-4.el7	@centos-base
perl-Pod-Simple.noarch	1:3.28-4.el7	@centos-base
perl-Pod-Usage.noarch	1.63-3.el7	@centos-base
perl-Scalar-List-Utils.x86_64	1.27-248.el7	@centos-base
perl-Socket.x86_64	2.010-5.el7	@centos-base
perl-Storable.x86_64	2.45-3.el7	@centos-base
perl-TermReadKey.x86_64	2.30-20.el7	@centos-base
perl-Text-ParseWords.noarch	3.29-4.el7	@centos-base
perl-Time-HiRes.x86_64	4:1.9725-3.el7	@centos-base
perl-Time-Local.noarch	1.2300-2.el7	@centos-base
perl-constant.noarch	1.27-2.el7	@centos-base
perl-libs.x86_64	4:5.16.3-295.el7	@centos-base
perl-macros.x86_64	4:5.16.3-295.el7	@centos-base
perl-parent.noarch	1:0.225-244.el7	@centos-base
perl-podlators.noarch	2.5.1-3.el7	@centos-base
perl-threads.x86_64	1.87-4.el7	@centos-base
perl-threads-shared.x86_64	1.43-6.el7	@centos-base
pinentry.x86_64	0.8.1-17.el7	installed
pkgconfig.x86_64	1:0.27.1-4.el7	installed
policycoreutils.x86_64	2.5-34.el7	installed
policycoreutils-python.x86_64	2.5-34.el7	installed
polkit.x86_64	0.112-26.el7	installed
polkit-pkla-compat.x86_64	0.1-4.el7	installed
popt.x86_64	1.13-16.el7	installed
procps-ng.x86_64	3.3.10-27.el7	installed
product-manifest.noarch	321-2.el7.centos.ta	@localrepo
psmisc.x86_64	22.20-16.el7	@centos-base
pth.x86_64	2.0.7-23.el7	installed
pygpgme.x86_64	0.3-9.el7	installed
pyliblzma.x86_64	0.5.3-11.el7	installed
pysendfile.x86_64	2.0.0-5.el7	@centos-cloud
pyserial.noarch	2.6-6.el7	installed
python.x86_64	2.7.5-88.el7	installed
python-IPy.noarch	0.75-6.el7	installed



python-UcsSdk.noarch	0.8.2.5-1.el7	@centos-cloud
python-aniso8601.noarch	0.82-3.el7	@epel
python-anyjson.noarch	0.3.3-3.el7	@centos-cloud
python-backports.x86_64	1.0-8.el7	installed
python-backports-ssl_match_hostname.noarch	3.5.0.1-1.el7	installed
python-beaker.noarch	1.5.4-10.el7	@centos-base
python-beautifulsoup4.noarch	4.6.0-1.el7	@centos-cloud
python-cephfs.x86_64	2:12.2.11-0.el7	@centos-ceph
python-chardet.noarch	2.2.1-3.el7	installed
python-cherrypy.noarch	3.2.2-4.el7	@centos-base
python-cmd2.noarch	0.6.8-8.el7	@centos-cloud
python-configobj.noarch	4.7.2-7.el7	installed
python-configparser.noarch	4.0.2-2.el7	@epel
python-construct.noarch	2.8.10-1.el7	@centos-cloud
python-contextlib2.noarch	0.5.1-3.el7	@epel
python-decorator.noarch	3.4.0-3.el7	installed
python-django-bash-completion.noarch	1.11.27-1.el7	@epel
python-dns.noarch	1.15.0-5.el7	@centos-cloud
python-dogpile-cache.noarch	0.6.2-1.el7	@centos-cloud
python-dogpile-core.noarch	0.4.1-2.el7	@centos-cloud
python-dracclient.noarch	1.6.0-1.el7	@centos-cloud
python-editor.noarch	0.4-4.el7	@centos-cloud
python-enum34.noarch	1.0.4-1.el7	@centos-base
python-extras.noarch	1.0.0-2.el7	@epel
python-flask.noarch	1:0.10.1-5.el7_7	@centos-extras
python-gobject-base.x86_64	3.22.0-1.el7_4.1	installed
python-ilorest-library.x86_64	v2.3.1.29.gf6dae68-1.el7.centos.ta.1	@akraino-ta
python-iniparse.noarch	0.4-9.el7	installed
python-inotify.noarch	0.9.4-4.el7	@centos-base
python-ipaddr.noarch	2.1.11-2.el7	@centos-base
python-ipaddress.noarch	1.0.16-3.el7	@centos-cloud
python-ironic-inspector-client.noarch	3.1.2-1.el7	@centos-cloud
python-ironic-lib.noarch	2.12.4-1.el7	@centos-cloud
python-itsdangerous.noarch	0.23-2.el7	@centos-extras
python-jsonpath-rw.noarch	1.2.3-2.el7	@centos-cloud
python-jwcrypto.noarch	0.4.2-1.el7	@centos-base
python-kazoo.noarch	2.2.1-1.el7	@centos-cloud
python-keyring.noarch	5.7.1-1.el7	@centos-cloud
python-keystone.noarch	1:13.0.4-1.el7	@centos-cloud
python-kitchen.noarch	1.1.1-5.el7	installed
python-ldap.x86_64	2.4.15-2.el7	@centos-base
python-ldappool.noarch	1.0-4.el7	@centos-cloud
python-libs.x86_64	2.7.5-88.el7	installed
python-linecache2.noarch	1.0.0-1.el7	@centos-cloud
python-linux-procfs.noarch	0.4.11-4.el7	installed
python-logutils.noarch	0.3.3-3.el7	@centos-ceph
python-lxml.x86_64	3.2.1-4.el7	@centos-base
python-mako.noarch	0.8.1-2.el7	@centos-base
python-memcached.noarch	1.58-1.el7	@centos-cloud
python-migrate.noarch	0.11.0-1.el7	@centos-cloud
python-monotonic.noarch	0.6-1.el7	@centos-cloud
python-netifaces.x86_64	0.10.4-3.el7	@centos-base
python-openstackclient-lang.noarch	3.14.3-1.el7	@centos-cloud
python-oslo-cache-lang.noarch	1.28.1-1.el7	@centos-cloud
python-oslo-concurrency-lang.noarch	3.25.1-1.el7	@centos-cloud
python-oslo-db-lang.noarch	4.33.4-1.el7	@centos-cloud
python-oslo-il8n-lang.noarch	3.19.0-1.el7	@centos-cloud
python-oslo-log-lang.noarch	3.36.0-1.el7	@centos-cloud
python-oslo-middleware-lang.noarch	3.34.0-1.el7	@centos-cloud
python-oslo-policy-lang.noarch	1.33.2-1.el7	@centos-cloud
python-oslo-utils-lang.noarch	3.35.1-1.el7	@centos-cloud
python-oslo-versionedobjects-lang.noarch	1.31.3-1.el7	@centos-cloud
python-paramiko.noarch	2.1.1-9.el7	@centos-base
python-paste.noarch	1.7.5.1-9.20111221hg1498.el7	@centos-base
python-paste-deploy.noarch	1.5.2-6.el7	@centos-cloud
python-perf.x86_64	3.10.0-1127.19.1.el7	@centos-updates
python-ply.noarch	3.4-11.el7	@centos-base
python-prettytable.noarch	0.7.2-3.el7	installed
python-progressbar.noarch	2.3-4.el7	@epel
python-proliantutils.noarch	2.5.0-1.el7	@centos-cloud
python-pycadf-common.noarch	2.7.0-1.el7	@centos-cloud

python-pycparser.noarch	2.14-1.el7	@centos-base
python-pycurl.x86_64	7.19.0-19.el7	installed
python-pyudev.noarch	0.15-9.el7	installed
python-rados.x86_64	2:12.2.11-0.el7	@centos-ceph
python-rbd.x86_64	2:12.2.11-0.el7	@centos-ceph
python-repoze-lru.noarch	0.4-3.el7	@centos-cloud
python-repoze-who.noarch	2.1-1.el7	@centos-cloud
python-requestbuilder.noarch	0.7.1-1.el7	@epel
python-retrying.noarch	1.2.3-4.el7	@centos-cloud
python-rgw.x86_64	2:12.2.11-0.el7	@centos-ceph
python-routes.noarch	2.4.1-1.el7	@centos-cloud
python-schedutils.x86_64	0.4-6.el7	installed
python-simplegeneric.noarch	0.8-7.el7	@centos-ceph
python-sqlparse.noarch	0.1.18-5.el7	@centos-cloud
python-tempita.noarch	0.5.1-8.el7	@centos-cloud
python-testtools.noarch	1.8.0-2.el7	@centos-cloud
python-unicodcsv.noarch	0.14.1-4.el7	@epel
python-unittest2.noarch	1.1.0-4.el7	@epel
python-urlgrabber.noarch	3.10-10.el7	installed
python-waitress.noarch	0.8.9-5.el7	@centos-cloud
python-warlock.noarch	1.0.1-1.el7	@centos-cloud
python-webob.noarch	1.7.2-2.el7	@centos-cloud
python-webtest.noarch	2.0.23-1.el7	@centos-cloud
python-werkzeug.noarch	0.9.1-2.el7	@centos-extras
python-wrapt.x86_64	1.10.8-2.el7	@centos-cloud
python-zope-interface.x86_64	4.0.5-4.el7	@centos-base
python2-PyMySQL.noarch	0.9.3-1.el7	@epel
python2-alembic.noarch	0.9.7-1.el7	@centos-cloud
python2-amqp.noarch	2.4.0-1.el7	@epel
python2-appdirs.noarch	1.4.0-4.el7	@centos-cloud
python2-asn1crypto.noarch	0.24.0-7.el7	@epel
python2-automaton.noarch	1.14.0-1.el7	@centos-cloud
python2-babel.noarch	2.3.4-1.el7	@centos-cloud
python2-bcrypt.x86_64	3.1.6-2.el7	@epel
python2-cachetools.noarch	2.0.1-3.el7	@centos-cloud
python2-cffi.x86_64	1.11.2-1.el7	@centos-cloud
python2-cinderclient.noarch	3.5.0-1.el7	@centos-cloud
python2-cliff.noarch	2.11.1-1.el7	@centos-cloud
python2-crypto.x86_64	2.6.1-16.el7	@epel
python2-cryptography.x86_64	2.1.4-2.el7	@centos-cloud
python2-dateutil.noarch	1:2.6.1-1.el7	@centos-cloud
python2-debtcollector.noarch	1.19.0-1.el7	@centos-cloud
python2-deprecation.noarch	1.0-3.el7	@centos-cloud
python2-django.noarch	1.11.27-1.el7	@epel
python2-eventlet.noarch	0.20.1-6.el7	@centos-cloud
python2-fasteners.noarch	0.14.1-6.el7	@centos-cloud
python2-fixtures.noarch	3.0.0-7.el7	@centos-cloud
python2-flask-restful.noarch	0.3.5-4.el7	@epel
python2-funcsigs.noarch	1.0.2-4.el7	@epel
python2-futures.noarch	3.1.1-5.el7	@centos-base
python2-futurist.noarch	1.6.0-1.el7	@centos-cloud
python2-glanceclient.noarch	1:2.10.1-1.el7	@centos-cloud
python2-greenlet.x86_64	0.4.12-1.el7	@centos-cloud
python2-idna.noarch	2.5-1.el7	@centos-cloud
python2-ironicclient.noarch	2.2.1-1.el7.centos.ta	@akraino-ta
python2-iso8601.noarch	0.1.11-8.el7	@epel
python2-jinja2.noarch	2.10-2.el7	@centos-cloud
python2-jmespath.noarch	0.9.4-2.el7	@epel
python2-jsonpatch.noarch	1.21-1.el7	@centos-cloud
python2-jsonpointer.noarch	1.10-4.el7	@centos-cloud
python2-jsonschema.noarch	2.6.0-2.el7	@centos-cloud
python2-keystoneauth1.noarch	3.4.1-1.el7	@centos-cloud
python2-keystoneclient.noarch	1:3.15.1-1.el7	@centos-cloud
python2-keystonemiddleware.noarch	4.22.0-1.el7	@centos-cloud
python2-kombu.noarch	1:4.2.2-1.el7	@epel
python2-markupsafe.x86_64	0.23-16.el7	@centos-cloud
python2-mimeparse.noarch	1.6.0-5.el7	@epel
python2-mock.noarch	2.0.0-1.el7	@centos-cloud
python2-msgpack.x86_64	0.5.6-5.el7	@epel
python2-munch.noarch	2.2.0-2.el7	@centos-cloud
python2-netaddr.noarch	0.7.19-5.el7	@centos-cloud

python2-neutronclient.noarch	6.7.0-1.el7	@centos-cloud
python2-novaclient.noarch	1:10.1.1-1.el7	@centos-cloud
python2-oauthlib.noarch	2.0.1-8.el7	@centos-base
python2-openstackclient.noarch	3.14.3-1.el7	@centos-cloud
python2-openstacksdk.noarch	0.11.4-1.el7	@centos-cloud
python2-os-client-config.noarch	1.29.0-1.el7	@centos-cloud
python2-os-service-types.noarch	1.1.0-1.el7	@centos-cloud
python2-os-traits.noarch	0.5.0-1.el7	@centos-cloud
python2-osc-lib.noarch	1.9.0-1.el7	@centos-cloud
python2-oslo-cache.noarch	1.28.1-1.el7	@centos-cloud
python2-oslo-concurrency.noarch	3.25.1-1.el7	@centos-cloud
python2-oslo-config.noarch	2:5.2.1-1.el7	@centos-cloud
python2-oslo-context.noarch	2.20.0-1.el7	@centos-cloud
python2-oslo-db.noarch	4.33.4-1.el7	@centos-cloud
python2-oslo-il8n.noarch	3.19.0-1.el7	@centos-cloud
python2-oslo-log.noarch	3.36.0-1.el7	@centos-cloud
python2-oslo-messaging.noarch	5.35.6-1.el7	@centos-cloud
python2-oslo-middleware.noarch	3.34.0-1.el7	@centos-cloud
python2-oslo-policy.noarch	1.33.2-1.el7	@centos-cloud
python2-oslo-reports.noarch	1.26.0-1.el7	@centos-cloud
python2-oslo-rootwrap.noarch	5.13.0-1.el7	@centos-cloud
python2-oslo-serialization.noarch	2.24.0-1.el7	@centos-cloud
python2-oslo-service.noarch	1.29.1-1.el7	@centos-cloud
python2-oslo-utils.noarch	3.35.1-1.el7	@centos-cloud
python2-oslo-versionedobjects.noarch	1.31.3-1.el7	@centos-cloud
python2-osprofiler.noarch	1.15.2-1.el7	@centos-cloud
python2-passlib.noarch	1.7.1-1.el7	@epel
python2-pbr.noarch	3.1.1-8.el7	@centos-cloud
python2-pecan.noarch	1.1.2-1.el7	@centos-ceph
python2-peewee.x86_64	2.10.2-3.el7.centos.ta	@akraino-ta
python2-pika.noarch	0.10.0-10.el7	@epel
python2-pika_pool.noarch	0.1.3-3.el7	@centos-cloud
python2-pip.noarch	8.1.2-14.el7	@epel
python2-psutil.x86_64	5.6.7-1.el7	@epel
python2-pyOpenSSL.noarch	17.3.0-3.el7	@centos-cloud
python2-pyasn1.noarch	0.1.9-7.el7	@centos-base
python2-pycadf.noarch	2.7.0-1.el7	@centos-cloud
python2-pyghmi.noarch	1.0.22-1.el7	@centos-cloud
python2-pyngus.noarch	2.3.0-1.el7	@epel
python2-pyparsing.noarch	2.1.10-7.el7	@centos-cloud
python2-pysaml2.noarch	3.0.2-2.el7	@centos-cloud
python2-pysnmp.noarch	4.3.2-3.el7	@centos-cloud
python2-pysocks.noarch	1.6.8-7.el7	@epel
python2-python-etcd.noarch	0.4.3-5.el7	@centos-cloud
python2-qpid-proton.x86_64	0.31.0-3.el7	@epel
python2-redis.noarch	2.10.6-1.el7	@epel
python2-requests.noarch	2.14.2-1.el7	@centos-cloud
python2-requestsexceptions.noarch	1.4.0-1.el7	@centos-cloud
python2-rfc3986.noarch	1.3.0-1.el7	@epel
python2-scciclient.noarch	0.6.1-1.el7	@centos-cloud
python2-scrypt.x86_64	0.8.0-2.el7	@centos-cloud
python2-setuptools.noarch	22.0.5-1.el7	@centos-cloud
python2-shade.noarch	1.27.2-1.el7	@centos-cloud
python2-simplejson.x86_64	3.10.0-2.el7	@epel
python2-singledispatch.noarch	3.4.0.3-4.el7	@centos-ceph
python2-six.noarch	1.10.0-9.el7	@centos-cloud
python2-sqlalchemy.x86_64	1.2.2-2.el7	@centos-cloud
python2-statsd.noarch	3.2.1-5.el7	@centos-cloud
python2-stevedore.noarch	1.28.0-1.el7	@centos-cloud
python2-sushy.noarch	1.3.4-1.el7	@centos-cloud
python2-swiftclient.noarch	3.5.1-1.el7	@centos-cloud
python2-tenacity.noarch	4.8.0-1.el7	@centos-cloud
python2-tooz.noarch	1.60.1-1.el7	@centos-cloud
python2-traceback2.noarch	1.4.0-7.el7	@epel
python2-urllib3.noarch	1.21.1-1.el7	@centos-cloud
python2-vine.noarch	1.2.0-1.el7	@epel
python2-virtualbmc.noarch	1.2.0-1.el7	@centos-cloud
python2-voluptuous.noarch	0.10.5-2.el7	@centos-cloud
python2-wsme.noarch	0.9.3-1.el7	@centos-cloud
python2-zake.noarch	0.2.2-2.el7	@centos-cloud
pytz.noarch	2016.10-2.el7	@centos-base

pyxattr.x86_64	0.5.1-5.el7	installed
qemu-guest-agent.x86_64	10:2.12.0-3.el7	installed
qemu-img-ev.x86_64	10:2.12.0-44.1.el7_8.1	@centos-kvm
qemu-kvm-common-ev.x86_64	10:2.12.0-44.1.el7_8.1	@centos-kvm
qpid-proton-c.x86_64	0.31.0-3.el7	@epel
qrencode-libs.x86_64	3.4.1-3.el7	installed
quota.x86_64	1:4.01-19.el7	installed
quota-nls.noarch	1:4.01-19.el7	installed
rabbitmq-server.noarch	3.6.16-1.el7	@centos-cloud
rdma-core.x86_64	22.4-4.el7_8	@centos-updates
readline.x86_64	6.2-11.el7	installed
recuserconfighandlers.noarch	c35.gc8427f2-1.el7.centos.ta	@akraino-ta
redis.x86_64	3.2.12-2.el7	@epel
rootfiles.noarch	8.1-11.el7	installed
rpcbind.x86_64	0.2.0-49.el7	installed
rpm.x86_64	4.11.3-43.el7	installed
rpm-build-libs.x86_64	4.11.3-43.el7	installed
rpm-libs.x86_64	4.11.3-43.el7	installed
rpm-python.x86_64	4.11.3-43.el7	installed
rsync.x86_64	3.1.2-10.el7	installed
rsyslog.x86_64	8.24.0-52.el7_8.2	@centos-updates
sed.x86_64	4.2.2-6.el7	installed
selinux-policy.noarch	3.13.1-266.el7_8.1	@centos-updates
selinux-policy-targeted.noarch	3.13.1-266.el7_8.1	@centos-updates
setools-libs.x86_64	3.3.8-4.el7	installed
setup.noarch	2.8.71-11.el7	installed
sg3_utils.x86_64	1:1.37-19.el7	installed
sg3_utils-libs.x86_64	1:1.37-19.el7	installed
shadow-utils.x86_64	2:4.6-5.el7	installed
shared-mime-info.x86_64	1.8-5.el7	installed
shellinabox.x86_64	2.20-5.el7	@epel
slang.x86_64	2.2.4-11.el7	installed
snappy.x86_64	1.1.0-3.el7	installed
socat.x86_64	1.7.3.2-2.el7	@centos-base
sqlite.x86_64	3.7.17-8.el7_7.1	installed
sshpas.x86_64	1.06-2.el7	@centos-extras
start-menu.noarch	c2.gb375099-1.el7.centos.ta	@akraino-ta
sudo.x86_64	1.8.23-9.el7	installed
systemd.x86_64	219-73.el7_8.9	@centos-updates
systemd-libs.x86_64	219-73.el7_8.9	@centos-updates
systemd-sysv.x86_64	219-73.el7_8.9	@centos-updates
sysvinit-tools.x86_64	2.88-14.dsfl.el7	installed
tar.x86_64	2:1.26-35.el7	installed
tcp_wrappers.x86_64	7.6-77.el7	installed
tcp_wrappers-libs.x86_64	7.6-77.el7	installed
tcpdump.x86_64	14:4.9.2-4.el7_7.1	@centos-base
traceroute.x86_64	3:2.0.22-2.el7	@centos-base
trousers.x86_64	0.3.14-2.el7	@centos-base
tuned.noarch	2.11.0-8.el7	installed
tzdata.noarch	2020a-1.el7	@centos-updates
unbound-libs.x86_64	1.6.6-5.el7_8	@centos-updates
userconfighandlers.noarch	c35.gc8427f2-1.el7.centos.ta	@akraino-ta
userspace-rcu.x86_64	0.10.0-3.el7	@centos-ceph
ustr.x86_64	1.0.4-16.el7	installed
util-linux.x86_64	2.23.2-63.el7	installed
uwsgi.x86_64	2.0.18-8.el7	@epel
uwsgi-plugin-common.x86_64	2.0.18-8.el7	@epel
uwsgi-plugin-python2.x86_64	2.0.18-8.el7	@epel
validators.noarch	c35.gc8427f2-1.el7.centos.ta	@akraino-ta
vim-common.x86_64	2:7.4.629-6.el7	@centos-base
vim-enhanced.x86_64	2:7.4.629-6.el7	@centos-base
vim-filessystem.x86_64	2:7.4.629-6.el7	@centos-base
vim-minimal.x86_64	2:7.4.629-6.el7	installed
virt-what.x86_64	1.18-4.el7	installed
wget.x86_64	1.14-18.el7_6.1	@centos-base
which.x86_64	2.20-7.el7	installed
xfsprogs.x86_64	4.5.0-20.el7	installed
xinetd.x86_64	2:2.3.15-14.el7	@centos-base
xz.x86_64	5.2.2-1.el7	installed
xz-libs.x86_64	5.2.2-1.el7	installed
yajl.x86_64	2.0.4-4.el7	@centos-base

yaml-cpp.x86_64	1:0.5.1-2.el7	@epel
yarf.x86_64	c2.g51e80b4-1.el7.centos.ta	@akraino-ta
yum.noarch	3.4.3-167.el7.centos	installed
yum-metadata-parser.x86_64	1.1.4-10.el7	installed
yum-plugin-fastestmirror.noarch	1.1.31-54.el7_8	@centos-updates
yum-plugin-priorities.noarch	1.1.31-54.el7_8	@centos-updates
yum-utils.noarch	1.1.31-54.el7_8	@centos-updates
zlib.x86_64	1.2.7-18.el7	installed
zlib-devel.x86_64	1.2.7-18.el7	@centos-base

## Upgrade Procedures

Currently REC only supports bare metal installation. In place upgrades are not supported. The upgrade procedure is the same as the initial installation procedure documented in the [REC Installation Guide](#).

## Release Upstream Compliance

With regard to the Akraino [R4 Release Upstream Compliance](#) policy, the REC Continuous Integration (or more specifically the Telco Appliance CI that REC uses) pulls in lots of software from upstream. All the details of what it pulls in and what it does with it is in the form of executable code in the various Gerrit repositories: <https://gerrit.akraino.org/r/admin/repos/q/filter:ta>

Some software gets pulled in as packages, some software gets compiled from source. REC (actually TA) as a whole is not intended as a fork of anything, it's purely intended to package and automate the bare metal installation and configuration of all the various software components.

## Release Data

### Radio Edge Cloud Repository

The Radio Edge Cloud repository is quite small and mostly contains simple workflow scripts that allow the Akraino Regional Controller to perform the installation of the Telco Appliance based bare metal installation used by REC. There have been no changes to the workflow since release 3.

### Telco Appliance Repositories

Radio Edge Cloud is primarily composed of code from the following Telco Appliance repositories. The list below shows the changes to each repository since the time of Akraino Release 1 at the end of May.

```
===== access-management =====
No changes since Release 3
===== ansible-role-ntp =====
No changes since Release 3
===== build-tools =====
Commit 7dca3e0 on Thu Oct 15 12:19:46 2020 -0400      Fix zipp version issue
===== caas-cpupooler =====
Commit 0b73036 on Wed Oct 7 09:55:03 2020 +0000      CPU Pooler version updated to 0.3.1
===== caas-danm =====
No changes since Release 3
===== caas-etcd =====
No changes since Release 3
===== caas-helm =====
No changes since Release 3
===== caas-install =====
No changes since Release 3
===== caas-kubedns =====
No changes since Release 3
===== caas-kubernetes =====
Commit 2b8e087 on Tue Nov 3 13:36:27 2020 -0500      Security: disable kubelet debugging handlers flag
===== caas-lcm =====
No changes since Release 3
===== caas-logging =====
No changes since Release 3
===== caas-metrics =====
No changes since Release 3
```

```

===== caas-registry =====
No changes since Release 3
===== caas-security =====
No changes since Release 3
===== caas-storage =====
No changes since Release 3
===== cloudtaf =====
No changes since Release 3
===== cm-plugins =====
No changes since Release 3
===== config-manager =====
No changes since Release 3
===== distributed-state-server =====
No changes since Release 3
===== hostcli =====
No changes since Release 3
===== hw-detector =====
No changes since Release 3
===== image-provision =====
No changes since Release 3
===== infra-ansible =====
Commit 76de2b3 on Fri Sep 18 14:42:10 2020 -0400      FIX: Change ownership of newly-created VGs
Commit d2a34bd on Sun Sep 6 13:37:11 2020 -0400      Remove XFS nobarrier option
===== ipa-deployer =====
No changes since Release 3
===== ironic =====
No changes since Release 3
===== ironicclient =====
No changes since Release 3
===== ironic-virtmedia-driver =====
Commit 9b864a4 on Thu Oct 15 15:27:04 2020 +0000      Merge "Boot nodes from virtual, rather than local, CD"
===== lockcli =====
===== manifest =====
Commit 7fec492 on Thu Oct 8 10:42:59 2020 -0400      Use latest CentOS 7
===== monitoring =====
No changes since Release 3
===== openstack-ansible =====
No changes since Release 3
===== openstack-ansible-galera_client =====
No changes since Release 3
===== openstack-ansible-galera_server =====
No changes since Release 3
===== openstack-ansible-haproxy_server =====
No changes since Release 3
===== openstack-ansible-memcached_server =====
No changes since Release 3
===== openstack-ansible-openstack_openrc =====
No changes since Release 3
===== openstack-ansible-os_ironic =====
No changes since Release 3
===== openstack-ansible-os_keystone =====
No changes since Release 3
===== openstack-ansible-plugins =====
No changes since Release 3
===== openstack-ansible-rabbitmq_server =====
No changes since Release 3
===== openstack-ansible-rsyslog_client =====
No changes since Release 3
===== os-net-config =====
No changes since Release 3
===== python-iloorest-library =====
No changes since Release 3
===== python-peewee =====
No changes since Release 3
===== remote-installer =====
Commit d1feeb7 on Mon Oct 19 16:23:09 2020 -0400      Fix: First boot from floppy, not CD-ROM
Commit bd5d485 on Thu Jun 11 10:35:17 2020 +0300      Fix BMCException handling
Commit f67d243 on Tue May 26 18:51:17 2020 +0200      BMC management: Increase BMC reset timeout
===== rpmbuilder =====
No changes since Release 3
===== start-menu =====

```

```
No changes since Release 3
===== storage =====
Commit bf14d32 on Mon Sep 21 14:50:59 2020 -0400      Rebalance root disk storage
Commit 6e4495a on Mon Sep 14 09:35:46 2020 -0400      Add MariaDB LV
Commit 81e5092 on Mon Sep 7 18:41:57 2020 +0000      Remove XFS nobarrier option
===== ta =====
Commit 5881b39 on Wed Jul 1 11:03:21 2020 -0400      Update INFO.yaml file with committer info
Commit f97916f on Fri Jun 12 13:01:19 2020 -0700      Add INFO.yaml file for TA blueprint
===== yarf =====
No changes since Release 3
```

## Known Limitations, Issues and Workarounds

As of this release, as with past REC releases, the bare metal deployment ends just prior to installation of the O-RAN RAN Intelligent Controller (RIC). The installation of the RIC is a separate post-install step following O-RAN-SC's instructions. The REC install provides the automation from bare metal (i.e. no OS installed) up to but not including the RIC install.

## References