Running ROS Noetic on an RK3328 Board

I was recently set the challenge of installing ROS Noetic onto a RK3328 board. I can’t yet reveal the product specifically, but I can document some of how I installed it. The board itself runs Debian with a 4.4.194-1-rockchip aarch64 kernel.

You can effectively follow the ROS instructions from the ROS wiki to get everything installed. There are some pre-reqs that I found and those are included in the full list below.

How does it work? Great! It runs ROS without issue. There are some oddities with the board itself and peripherals that need to be resolved but those will happen in time. It’s a very nice little setup and I can recommend it.

These are the packages I had to install, in no particular order (mostly because I can’t be bothered to grab this list in a real order:

base-passwd;base-files;libc6;perl-base;mawk;libacl1;adduser;apt;libapt-pkg5.0;libattr1;libaudit-common;libaudit1;bash;libbz2-1.0;libdebconfclient0;coreutils;dash;libdb5.3;debconf;debian-archive-keyring;debianutils;diffutils;e2fsprogs;libcom-err2;libext2fs2;libss2;findutils;gcc-8-base;libgcc1;libstdc++6;libc-bin;libgmp10;gpgv;libgnutls30;grep;gzip;hostname;init-system-helpers;libcap-ng0;libffi6;libgcrypt20;libgpg-error0;libidn2-0;libseccomp2;libselinux1;libsemanage-common;libsemanage1;libsepol1;libtasn1-6;libunistring2;libzstd1;liblz4-1;libncursesw6;libtinfo6;ncurses-base;ncurses-bin;libhogweed4;libnettle6;libp11-kit0;libpam-modules;libpam-modules-bin;libpam-runtime;libpam0g;libpcre3;sed;login;passwd;libsystemd0;libudev1;sysvinit-utils;tar;tzdata;bsdutils;fdisk;libblkid1;libfdisk1;libmount1;libsmartcols1;libuuid1;mount;util-linux;liblzma5;zlib1g;libapparmor1;libcap2;libargon2-1;dmsetup;libdevmapper1.02.1;libjson-c3;libssl1.1;libcryptsetup12;libidn11;libip4tc0;libkmod2;systemd;systemd-sysv;perl-modules-5.28;libgdbm6;libgdbm-compat4;libperl5.28;perl;libbluetooth3;libkeyutils1;libkrb5support0;libk5crypto3;libkrb5-3;libgssapi-krb5-2;libsasl2-modules-db;libsasl2-2;libldap-common;libldap-2.4-2;libnghttp2-14;libpsl5;librtmp1;libssh2-1;libcurl3-gnutls;libglib2.0-0;libjansson4;libmm-glib0;libndp0;libslang2;libnewt0.52;libnm0;libexpat1;libpolkit-gobject-1-0;libpolkit-agent-1-0;readline-common;libreadline7;libdbus-1-3;libteamdctl0;lsb-base;libnl-3-200;libnl-genl-3-200;libnl-route-3-200;libpcsclite1;wpasupplicant;dbus;udev;libpam-systemd;libpolkit-backend-1-0;policykit-1;network-manager;libpython3.7-minimal;python3.7-minimal;python3-minimal;mime-support;libmpdec2;libsqlite3-0;libpython3.7-stdlib;python3.7;libpython3-stdlib;python3;libbsd0;libedit2;openssh-client;openssh-sftp-server;libncurses6;libprocps7;procps;sensible-utils;ucf;libwrap0;openssh-server;ssh;cpio;libelf1;libmnl0;libxtables12;libcap2-bin;iproute2;ifupdown;iputils-ping;libisc-export1100;libdns-export1104;isc-dhcp-client;kmod;nano;netbase;xxd;vim-common;bash-completion;libfstrm0;libgeoip1;liblmdb0;libprotobuf-c1;libicu63;libxml2;libisc1100;libdns1104;libisccc161;libisccfg163;libbind9-161;liblwres161;bind9-host;libmagic-mgc;libmagic1;file;libpci3;pciutils;xz-utils;hicolor-icon-theme;libjpeg62-turbo;libpng16-16;libjbig0;libwebp6;libtiff5;libxau6;libxdmcp6;libxcb1;libx11-data;libx11-6;shared-mime-info;libgdk-pixbuf2.0-common;libgdk-pixbuf2.0-0;gtk-update-icon-cache;libfreetype6;fonts-dejavu-core;fontconfig-config;libfontconfig1;libpixman-1-0;libxcb-render0;libxcb-shm0;libxext6;libxrender1;libcairo2;libcroco3;fontconfig;libfribidi0;libthai-data;libdatrie1;libthai0;libpango-1.0-0;libgraphite2-3;libharfbuzz0b;libpangoft2-1.0-0;libpangocairo-1.0-0;librsvg2-2;librsvg2-common;adwaita-icon-theme;apt-transport-https;libsigsegv2;m4;autoconf;libavahi-common-data;libavahi-common3;libavahi-core7;libdaemon0;avahi-daemon;libavahi-client3;avahi-utils;bc;libpython3.7;libdconf1;dbus-user-session;dconf-service;dconf-gsettings-backend;libasound2-data;libasound2;libdw1;bluez;libical3;bluez-obexd;python3-dbus;libgirepository-1.0-1;gir1.2-glib-2.0;python3-gi;libatk1.0-data;libatk1.0-0;libatspi2.0-0;libatk-bridge2.0-0;libcairo-gobject2;liblcms2-2;libcolord2;libcups2;libepoxy0;libjson-glib-1.0-common;libjson-glib-1.0-0;libproxy1v5;glib-networking-common;glib-networking-services;gsettings-desktop-schemas;glib-networking;libsoup2.4-1;libsoup-gnome2.4-1;librest-0.7-0;libwayland-client0;libwayland-cursor0;libwayland-egl1;libxcomposite1;libxfixes3;libxcursor1;libxdamage1;libxi6;libxinerama1;xkb-data;libxkbcommon0;libxrandr2;libgtk-3-common;libgtk-3-0;notification-daemon;gnome-icon-theme;libasyncns0;x11-common;libice6;libsm6;libogg0;libflac8;libvorbis0a;libvorbisenc2;libsndfile1;libx11-xcb1;libxtst6;libpulse0;libpulse-mainloop-glib0;gir1.2-atk-1.0;gir1.2-freedesktop;gir1.2-gdkpixbuf-2.0;libxft2;libpangoxft-1.0-0;gir1.2-pango-1.0;gir1.2-gtk-3.0;libnotify4;gir1.2-notify-0.7;python3-cairo;python3-gi-cairo;libdbusmenu-glib4;libdbusmenu-gtk3-4;libindicator3-7;libappindicator3-1;gir1.2-appindicator3-0.1;blueman;openssl;ca-certificates;libdpkg-perl;libfile-fnmatch-perl;debsums;dhcpcd5;libassuan0;gpgconf;libksba8;libnpth0;dirmngr;distro-info-data;ethtool;fake-hwclock;fping;libpopt0;gdisk;libpackagekit-glib2-18;gir1.2-packagekitglib-1.0;gnupg-l10n;gnupg-utils;gpg;pinentry-curses;gpg-agent;gpg-wks-client;gpg-wks-server;gpgsm;gnupg;gnupg1;gnupg2;libgstreamer1.0-0;gstreamer1.0-tools;htop;libklibc;klibc-utils;initramfs-tools-core;linux-base;initramfs-tools;libsctp1;libiperf0;iperf3;iso-codes;iw;libonig5;libjq1;jq;kbd;libaom0;libapt-inst2.0;libdrm-common;libdrm2;libva2;libva-drm2;libva-x11-2;libvdpau1;libavutil56;libcodec2-0.8.1;libgsm1;libmp3lame0;libopenjp2-7;libopus0;libshine3;libsnappy1v5;libspeex1;libgomp1;libsoxr0;libswresample3;libtheora0;libtwolame0;libvpx5;libwavpack1;libwebpmux3;libx264-155;libnuma1;libx265-165;libxvidcore4;libzvbi-common;libzvbi0;libavcodec58;libavresample4;libsamplerate0;libjack-jackd2-0;libasound2-plugins;libgpm2;libiw30;libltdl7;liblzo2-2;libopts25;liborc-0.4-0;libparted2;libpulsedsp;libsbc1;libsensors-config;libsensors5;libspeexdsp1;libsysfs2;libtdb1;libusb-1.0-0;libwebrtc-audio-processing1;lsb-release;mtd-utils;net-tools;ntp;parted;psmisc;pulseaudio-utils;pulseaudio;pulseaudio-module-bluetooth;python-apt-common;python3-apt;python3-pycurl;python3-software-properties;resolvconf;rfkill;rsync;software-properties-common;strace;sudo;sysfsutils;sysstat;u-boot-tools;unzip;usb.ids;usbutils;vim-runtime;vim;wireless-tools;zip;rockchip-overlay;linux-headers-4.4.194-1-rockchip-g9c5394aea750;linux-firmware-image-4.4.194-1-rockchip-g9c5394aea750;linux-image-4.4.194-1-rockchip-g9c5394aea750;realtek-bt-firmware;resize-assistant;less;libpcre2-8-0;liberror-perl;git-man;git;patch;apt-utils;bzip2;manpages;binutils-common;libbinutils;binutils-aarch64-linux-gnu;binutils;libc-dev-bin;linux-libc-dev;libc6-dev;libisl19;libmpfr6;libmpc3;cpp-8;cpp;libcc1-0;libitm1;libatomic1;libasan5;liblsan0;libtsan0;libubsan1;libgcc-8-dev;gcc-8;gcc;libstdc++-8-dev;g++-8;g++;make;dpkg-dev;build-essential;libfakeroot;fakeroot;libalgorithm-diff-perl;libalgorithm-diff-xs-perl;libalgorithm-merge-perl;manpages-dev;libpython2.7-minimal;python2.7-minimal;python2-minimal;python-minimal;libpython2.7-stdlib;python2.7;libpython2-stdlib;libpython-stdlib;python2;python;sgml-base;autotools-dev;automake;libpipeline1;binfmt-support;bzip2-doc;cmake-data;libarchive13;libcurl4;libjsoncpp1;librhash0;libuv1;cmake;mysql-common;mariadb-common;libmariadb3;libevent-2.1-6;libunbound8;libgnutls-dane0;libgnutls-openssl27;libgnutlsxx28;libidn2-dev;libp11-kit-dev;libtasn1-6-dev;libgmpxx4ldbl;libgmp-dev;nettle-dev;libgnutls28-dev;zlib1g-dev;libmariadb-dev;libmariadb-dev-compat;default-libmysqlclient-dev;python3-lib2to3;python3-distutils;dh-python;xml-core;docutils-common;libgfortran5;libgfortran-8-dev;gfortran-8;gfortran;googletest;google-mock;libibverbs1;ibverbs-providers;icu-devtools;libapr1;uuid-dev;libsctp-dev;libapr1-dev;libaprutil1;libldap2-dev;libexpat1-dev;libaprutil1-dev;libassuan-dev;libblas3;libboost1.67-dev;libboost-dev;libboost1.67-tools-dev;libboost-tools-dev;libboost-atomic1.67.0;libboost-atomic1.67-dev;libboost-atomic-dev;libboost-system1.67.0;libboost-chrono1.67.0;libboost-chrono1.67-dev;libboost-chrono-dev;libboost-container1.67.0;libboost-container1.67-dev;libboost-container-dev;libboost-context1.67.0;libboost-context1.67-dev;libboost-context-dev;libboost-thread1.67.0;libboost-coroutine1.67.0;libboost-coroutine1.67-dev;libboost-coroutine-dev;libboost-date-time1.67.0;libboost-serialization1.67.0;libboost-serialization1.67-dev;libboost-date-time1.67-dev;libboost-date-time-dev;libboost-exception1.67-dev;libboost-exception-dev;libboost-filesystem1.67.0;libboost-fiber1.67.0;libboost-fiber1.67-dev;libboost-fiber-dev;libboost-system1.67-dev;libboost-filesystem1.67-dev;libboost-filesystem-dev;libboost-regex1.67.0;libboost-graph1.67.0;libboost-timer1.67.0;libboost-test1.67.0;libboost-test1.67-dev;libboost-graph1.67-dev;libboost-graph-dev;libevent-core-2.1-6;libevent-pthreads-2.1-6;libhwloc5;libpciaccess0;ocl-icd-libopencl1;libhwloc-plugins;libpmix2;libopenmpi3;libboost-mpi1.67.0;libboost-graph-parallel1.67.0;libboost-graph-parallel1.67-dev;libboost-graph-parallel-dev;libicu-dev;libboost-regex1.67-dev;libboost-iostreams1.67.0;libboost-iostreams1.67-dev;libboost-iostreams-dev;libboost-locale1.67.0;libboost-locale1.67-dev;libboost-locale-dev;libboost-log1.67.0;libboost-thread1.67-dev;libboost-log1.67-dev;libboost-log-dev;libboost-math1.67.0;libboost-math1.67-dev;libboost-math-dev;openmpi-common;libnl-3-dev;libnl-route-3-dev;libibverbs-dev;libnuma-dev;libltdl-dev;libhwloc-dev;openmpi-bin;libopenmpi-dev;mpi-default-dev;libboost-mpi1.67-dev;libboost-mpi-dev;libboost-python1.67.0;mpi-default-bin;libboost-mpi-python1.67.0;libboost-mpi-python1.67-dev;libboost-mpi-python-dev;libboost-numpy1.67.0;libboost-numpy1.67-dev;libboost-numpy-dev;libboost-program-options1.67.0;libboost-program-options1.67-dev;libboost-program-options-dev;libpython2.7;libpython2.7-dev;libpython2-dev;libpython-dev;python2.7-dev;python2-dev;python-dev;libpython3.7-dev;libpython3-dev;python3.7-dev;python3-dev;libboost-python1.67-dev;libboost-python-dev;libboost-random1.67.0;libboost-random1.67-dev;libboost-random-dev;libboost-regex-dev;libboost-serialization-dev;libboost-signals1.67.0;libboost-signals1.67-dev;libboost-signals-dev;libboost-stacktrace1.67.0;libboost-stacktrace1.67-dev;libboost-stacktrace-dev;libboost-system-dev;libboost-test-dev;libboost-thread-dev;libboost-timer1.67-dev;libboost-timer-dev;libboost-type-erasure1.67.0;libboost-type-erasure1.67-dev;libboost-type-erasure-dev;libboost-wave1.67.0;libboost-wave1.67-dev;libboost-wave-dev;libboost-all-dev;libbz2-dev;libcaf-openmpi-3;libcoarrays-dev;libcoarrays-openmpi-dev;libconsole-bridge0.4;pkg-config;libconsole-bridge-dev;libgpg-error-dev;libgpgme11;libgpgme-dev;libgtest-dev;libimagequant0;liblapack3;liblog4cxx10v5;l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