

Quick Start Guide: Nitrogen95 SMARC Beta Evaluation Kit

Documentation

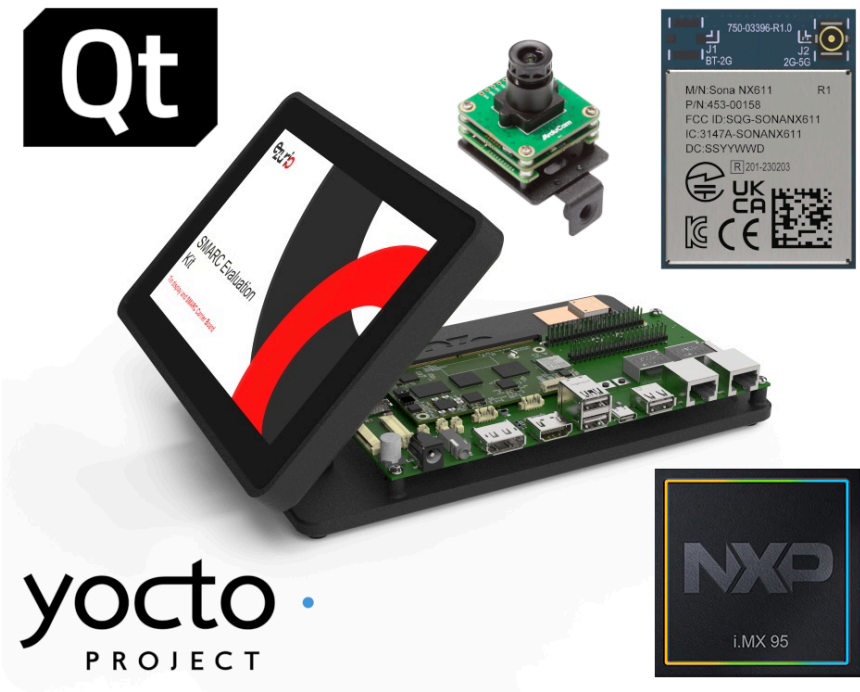
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Getting Started

Welcome to the **Quick Start Guide (QSG)** for Ezurio's **Nitrogen95 SMARC Development Board**: <https://www.ezurio.com/n95-dvk>. This guide will walk you through the initial setup process and introduce you to the key hardware and software components of the kit. It's designed to help you quickly get up and running, understand what's included, and start exploring the platform. If you encounter any issues or have questions, please visit <https://www.ezurio.com/support> or contact us at support@ezurio.com. As always, let us know about your experience with the DVK – both the good and bad.

Please refer to <http://ezurio.com/n93-dvk> if you purchased a Nitrogen93 Evaluation Kit instead.



- [EZSMI-959-0816-00158-2-K2](#) (Nitrogen95 SMARC Beta Evaluation Kit without Camera),
- [EZSMI-959-0816-00158-2-KC](#) (Nitrogen95 SMARC Beta Evaluation Kit with Camera).

Part Number: EZSMI-959-0816-00158-2-K2

Rev: 1

Description: Nitrogen95 SMARC Evaluation Kit with Display

Date Code: SSYYWWD

Contents: Nitrogen95 SMARC, Sona NX611, FlexPIFA antenna, 7 inch Display, Display Stand, Display Cable, DB9 Serial Cable, AC Power supply

www.ezurio.com/n95-dvk



Heads up! Please note that #P/N EZSMI-959-0816-00158-2-KC is planned to launch in Q4 2025. This Quick Start Guide will be updated and extended once the product becomes available. We are also preparing OSM versions of the evaluation kit, starting with CarbonAM62 and 67, which are expected to follow in Q1 2026. Stay tuned for updates.

Unboxing

The following table provides a breakdown of the hardware components included in the Nitrogen95 SMARC Evaluation Kit:

Item	Additional Description & Details
------	----------------------------------

1	1× Nitrogen95 SMARC Module REV30	#EZSMI-959-0816-00158-2. Equipped with 8 GB RAM and 16 GB eMMC storage. Sona NX611M variant (#453-00118), M.2 1216 form factor, featuring integrated Wi-Fi 6 and Bluetooth 5.4 connectivity.
2	1× Heatsink	Dedicated cooling solution for the Nitrogen95 SMARC Family (#450-00218).
3	1× Universal SMARC Carrier Board REV20	#SMARC_CAR, development board for <u>all</u> SMARC modules and solutions by Ezurio.
4	1× 5V/4A 100–240 VAC Switching Power Supply	#FY0504000, includes region-specific AC power cord.
5	1× Dual DB9 Serial Cable	Provides terminal and debug access for both Cortex-A and Cortex-M cores.
6	1× 7" Touchscreen Display	#BD070LIC3 (MIPI version) with 33-pin FPC (0.5 mm pitch, 203 mm length) flex cable.
7	1× 2.4/5/6 GHz FlexPIFA Antenna	#EFB2471A3S-10MH4L with 10 cm cable.
8	1× Enclosure with Desktop Stand	Black enclosure with integrated stand.
9	1× Arducam xISP – IMX678 Camera <i>(Optional)</i>	#B0582, Arducam xISP – Darksee, Pre-tuned 8.3 MP Low-Light MIPI Camera Module.

Note: All accessories listed above are included unless otherwise stated.

Datasheets, Product Pages & DOCs

The following table provides an overview of available datasheets, product pages, and documentation (DOCs).

	Product	Datasheet	Product Page (+Buy)	Documentation
1	Enclosure with Desktop Stand	N/A	N/A	N/A
2	Nitrogen95 SMARC Module	Link	Link	Link
3	Universal SMARC Carrier Board	Link	Link	Link
4	Sona NX611 Wi-Fi 6 + BLE 5.4 Module	Link	Link	Link
5	BD070LIC3 – 7" Touchscreen Display	See documentation.	Link	Link
6	2.4/5/6 GHz FlexPIFA Antenna	Link	Link	Link

7	Heatsink for the Nitrogen95 SMARC Family	See documentation.	Link	Link
8	1× Arducam xISP – IMX678 Camera <i>(Optional)</i>	See documentation.	Link (Ezurio) Link (Arducam)	Link

The latest product brief for the Nitrogen95 SMARC Evaluation Kit can be found [here](#).

Board Assembly

The Nitrogen95 SMARC module, featuring on-board Wi-Fi 6 and Bluetooth 5.4, comes fully assembled with the Universal SMARC Carrier Board, heatsink, 7" touchscreen display, enclosure, desktop stand, and all necessary mounting hardware / screws / accessories – ready to use straight out of the box. The complete setup weighs 1.69 kg in total. The display connects to the motherboard via the **MIPI-DSI** interface (**DSI0**) using a 33-pin FPC/FFC ribbon cable, with the heatsink pre-attached to the module. By default, the antenna is glued to the stand for convenience and stability.

You can adjust the screen tilt vertically, like a laptop, to match your setup and preferences. If wireless connectivity is required, make sure the antenna is securely connected to **U9** and the **MHF4L** connector on the PCB of the Sona NX611 module. We do not recommend removing the heatsink, but if necessary, it can be done using a 3 mm hex socket bit.

Stock Bootloader & OS

The system ships with **U-Boot v2024.04** and the **Yocto Scarthgap Boot2Qt** release pre-installed on the eMMC (as of the time of writing). The example below shows the output from **U-Boot SPL**, **Proper, Environment Variables**, and the **Linux / Kernel** startup log. You can use this as a reference to verify or compare the output from your own board.

To reprogram the eMMC, please follow the steps in <https://www.ezurio.com/resources/software-announcements/programming-emmc-on-i-mx-platforms>. Alternatively, use [balenaEtcher](#) (available for both **Windows** and **Linux**) to make the SOM boot from an SD card or a USB stick.

U-Boot SPL

```
U-Boot SPL 2024.04-00072-g67fd254f486 (Aug 20 2025 - 09:13:50 +0200)
SOC: 0xb0009500
LC: 0x40010
SYS Boot reason: por, origin: -1, errid: -1
SYS shutdown reason: por, origin: -1, errid: -1
DDRMIX is powered UP
Normal Boot
Trying to boot from MMC1
Primary set selected
Load image from MMC/SD 0xe0800
NOTICE: BL31: v2.12.0(release):1f-6.12.20-2.0.0-5-geb84dde3e-dirty
NOTICE: BL31: Built : 21:16:58, Aug 19 2025
```

U-Boot Proper

```
U-Boot 2024.04-00072-g67fd254f486 (Aug 20 2025 - 09:13:50 +0200)

CPU:   i.MX95 rev2.0 at 1800MHz
CPU:   Extended Industrial temperature grade (-40C to 125C) at 56C
LM Boot reason: por, origin: -1, errid: -1
LM shutdown reason: por, origin: -1, errid: -1
Model: Ezurio Nitrogen95 SMARC board
DRAM:  7.8 GiB
Core:  281 devices, 31 uclasses, devicetree: separate
MMC:   FSL_SDHC: 0, FSL_SDHC: 1, FSL_SDHC: 2
Loading Environment from MMC... OK
Fail to setup video link
In:     serial
Out:    serial
Err:    serial

BuildInfo:
- SM firmware Build 648, Commit db9043a8, Aug 19 2025 17:01:35
- ELE firmware version 2.0.2-2a118457

Normal Boot
Hit any key to stop autoboot:  0
```

U-Boot Environment Variables

```
=> printenv
arch=arm
baudrate=115200
board=nitrogen-smarc
board_name=imx95_nitrogen-smarc
boot_a_script=load ${devtype} ${devnum}:${distro_bootpart} ${scriptaddr} ${prefix}${script}; source ${scriptaddr}
boot_efi_binary=load ${devtype} ${devnum}:${distro_bootpart} ${kernel_addr_r} efi/boot/bootaa64.efi; if fdt addr -q
${fdt_addr_r}; then bootefi ${kernel_addr_r} ${fdt_addr_r};else bootefi ${kernel_addr_r} ${fdtcontroladdr};fi
boot_efi_bootmgr=if fdt addr -q ${fdt_addr_r}; then bootefi bootmgr ${fdt_addr_r};else bootefi bootmgr;fi
boot_extlinux=sysboot ${devtype} ${devnum}:${distro_bootpart} any ${scriptaddr} ${prefix}${boot_syslinux_conf}
boot_fit=no
boot_net_usb_start=usb start
boot_pci_enum=pci enum
boot_prefixes=/ /boot/
boot_script_dhcp=boot.scr.uimg
boot_scripts=boot.scr.uimg boot.scr
boot_syslinux_conf=extlinux/extlinux.conf
boot_targets=mmc0 mmc1 usb0
bootcmd=run distro_bootcmd;run bsp_bootcmd
bootcmd_mmc0=devnum=0; run mmc_boot
bootcmd_mmc1=devnum=1; run mmc_boot
bootcmd_usb0=devnum=0; run usb_boot
bootdelay=2
bootm_size=0x10000000
cntr_addr=0xA8000000
cntr_file=os_cntr_signed.bin
console=ttyLP0
cpu=armv8
cpuidle=
distro_bootcmd=for target in ${boot_targets}; do run bootcmd_${target}; done
dtbos=imx95-nitrogen-smarc-dsi.dtbo imx95-nitrogen-smarc-nx611.dtbo
efi_dtb_prefixes=/ /dtb/ /dtb/current/
env_dev=0
env_part=1
eth1addr=00:19:b8:11:a7:78
ethact=enetc-0
ethaddr=00:19:b8:11:a7:77
ethprime=eth0
fastboot_raw_partition_bootloader=0x0 0x1ff0 mmcpart 1
fastboot_raw_partition_bootloader-env=0x1ff0 0x10 mmcpart 1
fdt_addr=0x93000000
fdt_addr_r=0x93000000
fdt_file=imx95-nitrogen-smarc.dtb
fdt_high=0xffffffffffffffff
fdtcontroladdr=fdec8260
fdtfile=imx95-nitrogen-smarc.dtb
fdtoverlay_addr_r=0x94000000
kernel_addr_r=0x90400000
load_efi_dtb=load ${devtype} ${devnum}:${distro_bootpart} ${fdt_addr_r} ${prefix}${efi_fdtfile}
loadaddr=0x90400000
mmc_boot=if mmc dev ${devnum}; then devtype=mmc; run scan_dev_for_boot_part; fi
mmcdev=0
netargs=setenv bootargs ${cpuidle} ${mcore_args} console=${console},115200 root=/dev/nfs ip=dhcp
nfsroot=${tftpserverip}:${nfsroot},v3,tcp
netboot=echo Booting from net ...; run netargs; if test ${ip_dyn} = yes; then setenv get_cmd dhcp; else setenv
get_cmd tftp; fi; ${get_cmd} ${loadaddr} ${tftpserverip}:Image; if ${get_cmd} ${fdt_addr_r}
${tftpserverip}:${fdt_file}; then fdt addr ${fdt_addr_r}; fdt resize 0x10000; for dtbfile in ${dtbos}; do dhcp
${fdtoverlay_addr_r} ${tftpserverip}:${dtbfile}; fdt apply ${fdtoverlay_addr_r}; done; booti ${loadaddr} -
${fdt_addr_r}; else echo WARN: Cannot load the DT; fi;
```

```
prepare_mcore=setenv mcore_args pd_ignore_unused;
scan_dev_for_boot=echo Scanning ${devtype} ${devnum}:${distro_bootpart}...; for prefix in ${boot_prefixes}; do run
scan_dev_for_extlinux; run scan_dev_for_scripts; done;run scan_dev_for_efi;
scan_dev_for_boot_part=part list ${devtype} ${devnum} -bootable devplist; env exists devplist || setenv devplist 1;
for distro_bootpart in ${devplist}; do if fstype ${devtype} ${devnum}:${distro_bootpart} bootfstype; then part uuid
${devtype} ${devnum}:${distro_bootpart} distro_bootpart_uuid ; run scan_dev_for_boot; fi; done; setenv devplist
scan_dev_for_efi=setenv efi_fdtfile ${fdtfile}; for prefix in ${efi_dtb_prefixes}; do if test -e ${devtype}
${devnum}:${distro_bootpart} ${prefix}${efi_fdtfile}; then run load_efi_dtb; fi;done;run boot_efi_bootmgr;if test -
e ${devtype} ${devnum}:${distro_bootpart} efi/boot/bootaa64.efi; then echo Found EFI removable media binary
efi/boot/bootaa64.efi; run boot_efi_binary; echo EFI LOAD FAILED: continuing...; fi; setenv efi_fdtfile
scan_dev_for_extlinux=if test -e ${devtype} ${devnum}:${distro_bootpart} ${prefix}${boot_syslinux_conf}; then echo
Found ${prefix}${boot_syslinux_conf}; run boot_extlinux; echo EXTlinux FAILED: continuing...; fi
scan_dev_for_scripts=for script in ${boot_scripts}; do if test -e ${devtype} ${devnum}:${distro_bootpart}
${prefix}${script}; then echo Found U-Boot script ${prefix}${script}; run boot_a_script; echo SCRIPT FAILED:
continuing...; fi; done
scriptaddr=0x93500000
sec_boot=no
soc=imx9
soc_type=imx95
splashimage=0xA0000000
uboot_defconfig=imx95_nitrogen_smarc
upgradeu=setenv boot_scripts upgrade.scr; boot;echo Upgrade failed!; setenv boot_scripts boot.scr;
usb_boot=usb start; if usb dev ${devnum}; then devtype=usb; run scan_dev_for_boot_part; fi
vendor=boundary
```

Environment size: 4366/8188 bytes

Linux / Kernel

Please see [nitrogen95-smarc-dvk-ful...](#) for the full boot log.

Login Credentials:

Username: root

Password: —

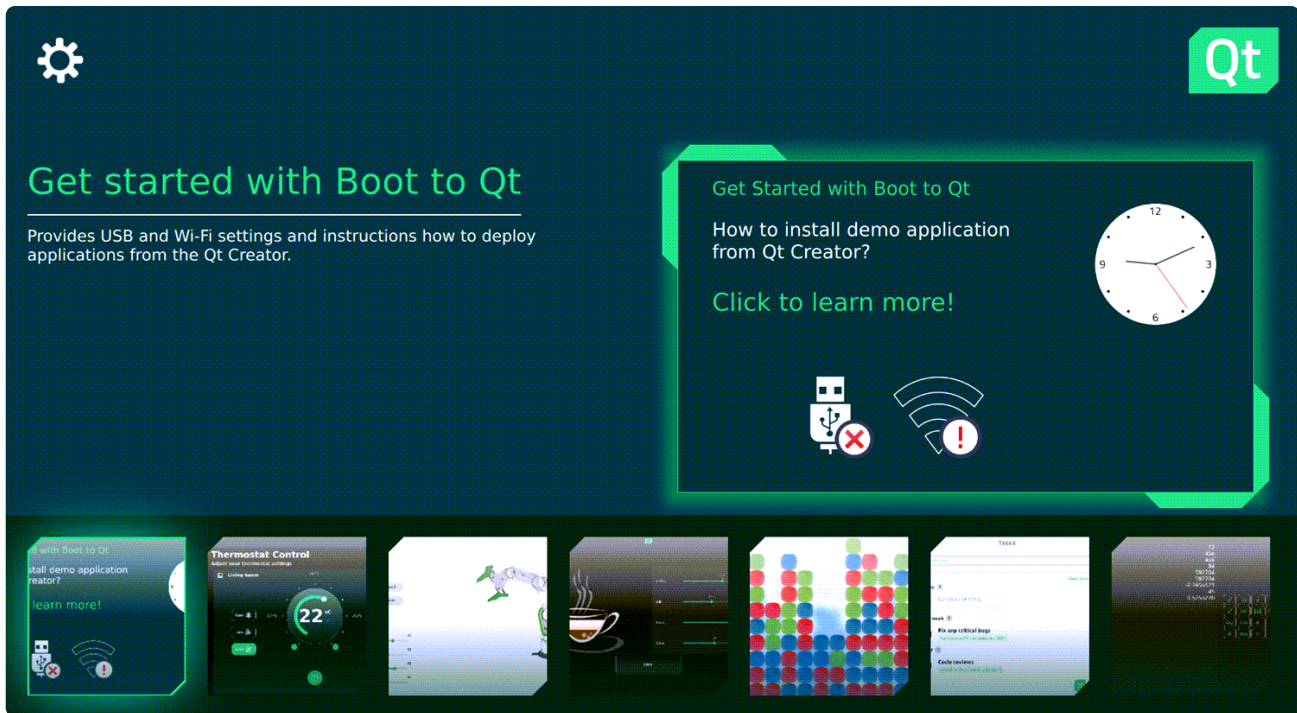
Hostname: b2qt-nitrogen95

“Hello World”

Once the Universal SMARC Carrier Board is powered through J17 using the DC barrel jack and the included power supply, the touchscreen display will initialize automatically. A green power indicator LED (D9) will illuminate; however, it may not be visible if the screen is folded down. Within a few seconds, the screen will display six Linux Tux (Penguins), followed by our Ezurio “IO” boot / loading animation. The system typically completes the boot process in under 30 seconds, after which the **Boot2Qt Demo Launcher** (see below) will appear.

Here you can select between a bunch of different demos, including: **Startup Screen**, **Thermostat**, **Robot Arm**, **Coffee Maschine**, **Same Game**, **To Do List**, and **Calqlatr**. In this case, please visit <https://doc.qt.io/Boot2Qt> and <https://code.qt.io/cgit/qt-apps/boot2qt-demos.git> for more information.

Tip: You can use Qt Creator to run, debug, and test your own applications on the Nitrogen95 SMARC Evaluation Kit. To do this, connect the kit to your computer using USB, Ethernet, or Wi-Fi. With a USB OTG cable, the board appears automatically in Qt Creator. For Ethernet, plug in a network cable and wait for the board to obtain an IP address. To connect over Wi-Fi, use the Boot to Qt Demo Launcher and ensure both the board and your computer are on the same network. Once connected, you're ready to start building and deploying your applications directly from Qt Creator.



Terminal and Debug Access

Cortex-M (MCU)

See section “[FreeRTOS / NXP MCUXpresso SDK \(2.16.0\)](#)” for more information

Cortex-A (CPU)

To set up and establish a serial connection, use the console cable provided in the kit. Connect the DB9 connector to the **6-pin Molex 53398-0671** header on the Universal SMARC Carrier Board (J18 , SERIAL) — you may need to gently lift the screen for better access — and attach other end labeled `CONSOLE` to your host PC through an 5V USB-to-Serial adapter (not included by default); in our example, we used the **Tripp Lite USA-19HS (Keyspan)**: <https://tripplite.eaton.com/keyspan-high-speed-usb-to-serial-adapter~USA19HS>. Windows users can choose from terminal applications such as [TeraTerm](#), [RealTerm](#), or [PuTTY](#), while Linux users should use tools like `screen`, `minicom` or `picocom`. The default serial settings are `115200` baud, `8` data bits, `n` parity, and `1` stop bit — commonly referred to as **8N1@115200**. Once everything is in place, press the **RESET** button (SW1), and you should see the system boot logs appear in your terminal window.

The RS232 communication requires and operates at **5V** TTL levels, not standard $\pm 12V$. If you prefer working with `fastboot` instead, then you may also want to connect a USB-C cable to `J25` and your PC. In this context, please note that powering the entire board and setup through the USB-C connection is not sufficient, as it exceeds the current limits of a standard USB port.

Remote Network Login via SSH and Ethernet 1 / 2

To connect the Nitrogen95 SMARC DVK to your local or public network, plug an **RJ45 Ethernet** cable into either `J31` or `J32` on the Universal SMARC Carrier Board. 100/1000 Mbps connections are supported on these two ports; 10 Gbps not. An SSH server (**OpenSSH**, `sshd`) is enabled by default and listens on port `22` for incoming connections in the background. It becomes active once the system has fully booted. Ensure that a **DHCP Server** is running on your network. By default, the DVK operates as a **DHCP Client**, automatically requesting and receiving **IPv4 + IPv6** addresses through **systemd-networkd** once available, as shown in the `ipconfig` and `ip` examples below:

```

root@b2qt-nitrogen95:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:19:B8:11:A7:77
          inet addr:192.168.2.179  Bcast:192.168.2.255  Mask:255.255.255.0
          inet6 addr: fe80::e09f:7bff:fe97:5078/64 Scope:Link
          inet6 addr: 2003:c9:cf3d:5818:e09f:7bff:fe97:5078/64 Scope:Global
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1497 errors:0 dropped:96 overruns:0 frame:0
          TX packets:277 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:109685 (107.1 KiB)  TX bytes:29518 (28.8 KiB)

eth1      Link encap:Ethernet  HWaddr 00:19:B8:11:A7:78
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:94 errors:0 dropped:0 overruns:0 frame:0
          TX packets:94 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8076 (7.8 KiB)  TX bytes:8076 (7.8 KiB)

uap0      Link encap:Ethernet  HWaddr EA:CB:F5:20:8A:F0
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

usb0      Link encap:Ethernet  HWaddr 3A:5C:4E:18:45:9F
          inet6 addr: fe80::385c:4eff:fe18:459f/64 Scope:Link
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

wfd0      Link encap:Ethernet  HWaddr EA:CB:F5:20:89:F0
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

wlan0     Link encap:Ethernet  HWaddr E8:CB:F5:20:89:F0
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

root@b2qt-nitrogen95:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever

```

```
inet6 ::1/128 scope host noprefixroute
    valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,DYNAMIC,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:19:b8:11:a7:77 brd ff:ff:ff:ff:ff:ff
    inet 192.168.2.179/24 brd 192.168.2.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 2003:c9:cf3d:5818:e09f:7bff:fe97:5078/64 scope global dynamic mngtmpaddr noprefixroute
        valid_lft 172752sec preferred_lft 86352sec
    inet6 fe80::e09f:7bff:fe97:5078/64 scope link proto kernel_ll
        valid_lft forever preferred_lft forever
3: eth1: <NO-CARRIER,BROADCAST,MULTICAST,DYNAMIC,UP> mtu 1500 qdisc mq state DOWN group default qlen 1000
    link/ether 00:19:b8:11:a7:78 brd ff:ff:ff:ff:ff:ff
4: can1: <NOARP,ECHO> mtu 16 qdisc noop state DOWN group default qlen 10
    link/can
5: can0: <NOARP,ECHO> mtu 16 qdisc noop state DOWN group default qlen 10
    link/can
6: wlan0: <NO-CARRIER,BROADCAST,MULTICAST,DYNAMIC,UP> mtu 1500 qdisc mq state DOWN group default qlen 1000
    link/ether e8:cb:f5:20:89:f0 brd ff:ff:ff:ff:ff:ff
7: uap0: <NO-CARRIER,BROADCAST,MULTICAST,DYNAMIC,UP> mtu 1500 qdisc mq state DOWN group default qlen 1000
    link/ether ea:cb:f5:20:8a:f0 brd ff:ff:ff:ff:ff:ff
8: wfd0: <NO-CARRIER,BROADCAST,MULTICAST,DYNAMIC,UP> mtu 1500 qdisc mq state DOWN group default qlen 1000
    link/ether ea:cb:f5:20:89:f0 brd ff:ff:ff:ff:ff:ff
9: usb0: <NO-CARRIER,BROADCAST,MULTICAST,DYNAMIC,UP> mtu 1500 qdisc pfifo_fast state DOWN group default qlen 1000
    link/ether 3a:5c:4e:18:45:9f brd ff:ff:ff:ff:ff:ff
    inet6 fe80::385c:4eff:fe18:459f/64 scope link proto kernel_ll
        valid_lft forever preferred_lft forever
```

System Processes and Services

The following processes and services were captured and are automatically launched on the system at startup after a fresh boot:

```

root@b2qt-nitrogen95:~# ps aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  1.0  0.1  19588 11232 ?        Ss   14:45   0:02 /sbin/init fixrtc
root         2  0.0  0.0      0     0 ?        S    14:45   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        S    14:45   0:00 [pool_workqueue_release]
root         4  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-rcu_g]
root         5  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-rcu_p]
root         6  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-slub_]
root         7  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-netns]
root         8  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/0:0-device_link_wq]
root         9  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/0:0H-events_highpri]
root        10  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/0:1-device_link_wq]
root        11  0.3  0.0      0     0 ?        D    14:45   0:00 [kworker/u12:0+events_unbound]
root        12  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-mm_pe]
root        13  0.0  0.0      0     0 ?        I    14:45   0:00 [rcu_tasks_kthread]
root        14  0.0  0.0      0     0 ?        S    14:45   0:00 [ksoftirqd/0]
root        15  0.0  0.0      0     0 ?        I    14:45   0:00 [rcu_preempt]
root        16  0.0  0.0      0     0 ?        S    14:45   0:00 [migration/0]
root        17  0.0  0.0      0     0 ?        S    14:45   0:00 [cpuhp/0]
root        18  0.0  0.0      0     0 ?        S    14:45   0:00 [cpuhp/1]
root        19  0.0  0.0      0     0 ?        S    14:45   0:00 [migration/1]
root        20  0.0  0.0      0     0 ?        S    14:45   0:00 [ksoftirqd/1]
root        21  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/1:0-device_link_wq]
root        22  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/1:0H-events_highpri]
root        23  0.0  0.0      0     0 ?        S    14:45   0:00 [cpuhp/2]
root        24  0.0  0.0      0     0 ?        S    14:45   0:00 [migration/2]
root        25  0.0  0.0      0     0 ?        S    14:45   0:00 [ksoftirqd/2]
root        26  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/2:0-events]
root        27  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/2:0H-kblockd]
root        28  0.0  0.0      0     0 ?        S    14:45   0:00 [cpuhp/3]
root        29  0.0  0.0      0     0 ?        S    14:45   0:00 [migration/3]
root        30  0.0  0.0      0     0 ?        S    14:45   0:00 [ksoftirqd/3]
root        31  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/3:0-pm]
root        32  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/3:0H-kblockd]
root        33  0.0  0.0      0     0 ?        S    14:45   0:00 [cpuhp/4]
root        34  0.0  0.0      0     0 ?        S    14:45   0:00 [migration/4]
root        35  0.0  0.0      0     0 ?        S    14:45   0:00 [ksoftirqd/4]
root        36  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/4:0-events]
root        37  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/4:0H-kblockd]
root        38  0.0  0.0      0     0 ?        S    14:45   0:00 [cpuhp/5]
root        39  0.0  0.0      0     0 ?        S    14:45   0:00 [migration/5]
root        40  0.0  0.0      0     0 ?        S    14:45   0:00 [ksoftirqd/5]
root        41  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/5:0-events]
root        42  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/5:0H-kblockd]
root        43  0.0  0.0      0     0 ?        S    14:45   0:00 [kdevtmpfs]
root        44  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-inet_]
root        45  0.1  0.0      0     0 ?        I    14:45   0:00 [kworker/u12:1-events_freezable_power_]
root        46  0.0  0.0      0     0 ?        S    14:45   0:00 [kauditd]
root        47  0.0  0.0      0     0 ?        S    14:45   0:00 [oom_reaper]
root        48  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-write]
root        49  0.0  0.0      0     0 ?        S    14:45   0:00 [kcompactd0]
root        50  0.0  0.0      0     0 ?        SN   14:45   0:00 [ksmd]
root        51  0.0  0.0      0     0 ?        SN   14:45   0:00 [khugepaged]
root        52  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-kinte]
root        53  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-kbloc]
root        54  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-blkcg]
root        55  0.2  0.0      0     0 ?        I    14:45   0:00 [kworker/u12:2-events_freezable_power_]
root        56  0.1  0.0      0     0 ?        I    14:45   0:00 [kworker/u12:3-devfreq_wq]
root        57  0.0  0.0      0     0 ?        I    14:45   0:00 [kworker/u12:4-events_unbound]
root        58  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-ata_s]
root        59  0.0  0.0      0     0 ?        I<   14:45   0:00 [kworker/R-devfr]

```

root	60	0.0	0.0	0	0 ?	S	14:45	0:00	[watchdogd]
root	61	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:1-pm]
root	62	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/0:1H-mmc_complete]
root	63	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-rpcio]
root	64	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-xpti]
root	65	0.0	0.0	0	0 ?	S	14:45	0:00	[kswapd0]
root	66	0.0	0.0	0	0 ?	S	14:45	0:00	[ecryptfs-kthread]
root	67	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-nfsio]
root	68	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-kthro]
root	70	0.0	0.0	0	0 ?	S	14:45	0:00	[irq/22-arm-smmu-v3-evtq]
root	71	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-uas]
root	72	1.3	0.0	0	0 ?	I	14:45	0:03	[kworker/u12:5-events_freezable_power_]
root	73	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/2:1-pm]
root	74	0.0	0.0	0	0 ?	S	14:45	0:00	[hwrng]
root	75	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-neutr]
root	76	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-tls-s]
root	77	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-mld]
root	78	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-ipv6_]
root	79	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-kstrp]
root	80	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/3:1-mm_percpu_wq]
root	81	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/3:2-device_link_wq]
root	82	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/3:3-rcu_gp]
root	83	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/3:4]
root	84	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/0:2-events]
root	85	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/0:3-device_link_wq]
root	86	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/0:4-events]
root	87	0.1	0.0	0	0 ?	I	14:45	0:00	[kworker/0:5-events]
root	88	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/4:1-rcu_gp]
root	89	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/u12:6-events_unbound]
root	90	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/5:1-events]
root	92	0.0	0.0	0	0 ?	S	14:45	0:00	[spi0]
root	93	0.0	0.0	0	0 ?	S	14:45	0:00	[irq/200-4c010010.usb]
root	94	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-imx95]
root	95	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/5:2-device_link_wq]
root	96	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/u13:0-MOAL_WORK_QUEUE]
root	97	0.0	0.0	0	0 ?	S	14:45	0:00	[mali-simple-power-model-temp-poll]
root	98	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-rpmsg]
root	99	0.0	0.0	0	0 ?	S	14:45	0:00	[irq/202-vpu_irq]
root	100	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/0:6]
root	101	0.4	0.0	0	0 ?	I<	14:45	0:01	[kworker/u13:1-ipa_ctrl_wq]
root	102	0.0	0.0	0	0 ?	S	14:45	0:00	[irq/203-6-0022]
root	103	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/4:2-mm_percpu_wq]
root	104	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/4:3-events]
root	105	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:2-device_link_wq]
root	106	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:3-pm]
root	107	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:4-events]
root	108	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:5-pm]
root	109	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:6-device_link_wq]
root	110	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:7-device_link_wq]
root	111	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:8-device_link_wq]
root	112	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:9-pm]
root	113	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:10-events]
root	114	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:11-pm]
root	115	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:12-rcu_gp]
root	116	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/1:13]
root	117	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-enetc]
root	118	0.0	0.0	0	0 ?	I<	14:45	0:00	[kworker/R-enetc]
root	121	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/2:2-events]
root	122	0.0	0.0	0	0 ?	S	14:45	0:00	[irq/198-4b0d0000.bridge]
root	123	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/2:3-events]
root	124	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/u12:7-events_unbound]
root	125	0.0	0.0	0	0 ?	I	14:45	0:00	[kworker/u12:8]


```

root      126  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/R-sdhci]
root      127  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/221-mmc0]
root      128  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/222-rv3028]
root      129  0.0  0.0      0      0 ?      I   14:45  0:00 [kworker/5:3-events]
root      130  0.0  0.0      0      0 ?      I   14:45  0:00 [kworker/5:4-rcu_gp]
root      131  0.0  0.0      0      0 ?      I   14:45  0:00 [kworker/5:5]
root      132  0.0  0.0      0      0 ?      S   14:45  0:00 [card0-crtc0]
root      133  0.0  0.0      0      0 ?      S   14:45  0:00 [card0-crtc1]
root      134  0.0  0.0      0      0 ?      I   14:45  0:00 [kworker/2:4]
root      135  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/R-sdhci]
root      136  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/201-mmc2]
root      137  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/R-sdhci]
root      138  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/224-mmc1]
root      139  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/239-42860000.mmc cd]
root      140  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/R-mmc_c]
root      141  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/5:1H]
root      142  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/241-ci_imx_wakeup]
root      143  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/R-ci_ot]
root      144  0.0  0.0      0      0 ?      S   14:45  0:00 [irq/223-hd3ss3220]
root      145  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/2:1H]
root      146  0.0  0.0      0      0 ?      S   14:45  0:00 [jbd2/mmcblk0p2-8]
root      147  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/R-ext4-]
root      149  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/3:1H-kblockd]
root      160  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/4:1H-kblockd]
root      161  0.0  0.0      0      0 ?      I<  14:45  0:00 [kworker/0:2H-mmc_complete]
root      172  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/1:1H-kblockd]
rpc       173  0.0  0.0    4644  2304 ?      Ss  14:46  0:00 /usr/sbin/rpcbind -w -f
root      176  0.2  0.0   40084  7808 ?      Ss  14:46  0:00 /usr/lib/systemd/systemd-journald
root      182  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/1:2H]
root      228  0.3  0.1   29352  9608 ?      Ss  14:46  0:00 /usr/lib/systemd/systemd-udev
systemd+  322  0.0  0.0   89252  6400 ?      Ssl 14:46  0:00 /usr/lib/systemd/systemd-timesyncd
root      463  0.0  0.0   14972  5376 ?      Ss  14:46  0:00 /usr/lib/systemd/systemd-userdbd
root      507  0.0  0.0   15632  5504 ?      S   14:46  0:00 systemd-userwork: waiting...
root      508  0.0  0.0   15928  5760 ?      S   14:46  0:00 systemd-userwork: waiting...
root      509  0.0  0.0   15932  5632 ?      S   14:46  0:00 systemd-userwork: waiting...
root      525  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-cfg80]
root      526  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/4:2H-kblockd]
root      534  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/2:2H-kblockd]
root      537  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MOAL_]
root      572  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MOAL_]
root      573  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MOAL_]
root      574  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MOAL_]
root      575  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MOAL_]
root      576  0.0  0.0      0      0 ?      S   14:46  0:00 [woal_reassoc_service]
root      603  0.0  0.0      0      0 ?      S   14:46  0:00 [irq/248-gt9271]
root      607  0.1  0.1  395776 10240 ?      Ssl 14:46  0:00 /usr/sbin/ModemManager
root      615  0.0  0.0    3512  1536 ?      Ss  14:46  0:00 /usr/sbin/klogd -n
root      623  0.0  0.0    3512  1536 ?      Ss  14:46  0:00 /usr/sbin/syslogd -n
message+  627  0.2  0.0    7140  3584 ?      Ss  14:46  0:00 /usr/bin/dbus-daemon --system --address=systemd:
--nofork --nopicfile --systemd-activation --syslog-only
root      628  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/3:2H]
root      629  0.0  0.0    2724  1408 ?      Ss  14:46  0:00 /usr/bin/firmwared -d /lib/firmware
root      647  0.0  0.0   16036  6784 ?      Ss  14:46  0:00 /usr/lib/systemd/systemd-logind
root      664  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/u13:2-hci0]
root      665  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-CSAw1]
root      666  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MCLIS]
root      667  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-CSAua]
root      668  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MCLIS]
root      669  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-CSAwf]
root      670  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/R-MCLIS]
root      692  0.1  0.0   16012  6400 ?      Ss  14:46  0:00 /usr/sbin/connmand -n
systemd+  693  0.1  0.0   16920  7680 ?      Ss  14:46  0:00 /usr/lib/systemd/systemd-networkd

```

```

root      705  0.0  0.0      0      0 ?      S   14:46  0:00 [irq/219-0003:01:00.0:07]
avahi     706  0.0  0.0    7524  3072 ?      Ss  14:46  0:00 avahi-daemon: running [b2qt-nitrogen95.local]
root      707  0.0  0.0    8140  4224 ?      Ss  14:46  0:00 /usr/libexec/bluetooth/bluetoothd
root      710  0.0  0.0      0      0 ?      S   14:46  0:00 [irq/220-0003:01:00.0:03]
root      711  0.1  0.1   15416  9472 ?      Ss  14:46  0:00 /usr/sbin/sdcsupp -u
root      713  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/u13:3-MOAL_WORK_QUEUE]
root      714  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/u13:4]
avahi     718  0.0  0.0    7228  1304 ?      S   14:46  0:00 avahi-daemon: chroot helper
root      723  0.2  0.5  2085968 45828 ?      Ssl 14:46  0:00 /usr/bin/containerd
root      729  0.0  0.1   56916 10240 ?      Ss  14:46  0:00 /usr/bin/appcontroller /usr/bin/ctllauncher
root      730  0.0  0.0    5260  1664 tty1     Ss+ 14:46  0:00 /sbin/agetty -o -p -- \u --noclear - linux
root      736  0.0  0.0    5392  2048 ttyLP0 Ss+ 14:46  0:00 /sbin/agetty -8 -L ttyLP0 115200 linux
root      737  0.0  0.0      0      0 ?      I<  14:46  0:00 [kworker/5:2H]
root      739  0.2  0.1   17676  9600 ?      Ss  14:46  0:00 /usr/lib/systemd/systemd --user
root      740 13.4  2.1 1571568 170348 ?      Sl  14:46  0:29 /usr/bin/ctllauncher
root      741  0.0  0.0   19332  2908 ?      S   14:46  0:00 (sd-pam)
root      775  1.5  0.0      0      0 ?      S   14:46  0:03 [mali-gpuq-kthread]
root      785  0.0  0.1  278312 12780 ?      Sl  14:46  0:00 /usr/bin/qdbus --usb-ethernet-function-name
ncm.usb0
root      824  0.2  0.1   12892  8192 ?      Ss  14:47  0:00 sshd: root@pts/0
root      826  0.0  0.0    7176  3584 pts/0    Ss  14:47  0:00 -sh
root      839  200  0.0    9372  3584 pts/0    R+  14:49  0:00 ps aux

```

```

root@b2qt-nitrogen95:~# systemctl list-units --type=service --state=running
UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
avahi-daemon.service               loaded active running Avahi mDNS/DNS-SD Stack
bluetooth.service                  loaded active running Bluetooth service
busybox-klogd.service               loaded active running Kernel Logging Service
busybox-syslog.service              loaded active running System Logging Service
connman.service                     loaded active running Connection service
containerd.service                 loaded active running containerd container runtime
dbus.service                        loaded active running D-Bus System Message Bus
demolauncher.service               loaded active running Boot to Qt Demo Launcher
firmware-loader.service             loaded active running Linux Firmware Loader Daemon
getty@tty1.service                  loaded active running Getty on tty1
ModemManager.service                loaded active running Modem Manager
qdbus.service                       loaded active running Qt Debug Bridge Daemon
rpcbind.service                     loaded active running RPC Bind
serial-getty@ttyLP0.service          loaded active running Serial Getty on ttyLP0
sshd@0-192.168.2.179:22-192.168.2.121:52034.service loaded active running OpenSSH Per-Connection Daemon
(192.168.2.121:52034)
systemd-journald.service             loaded active running Journal Service
systemd-logind.service               loaded active running User Login Management
systemd-networkd.service             loaded active running Network Configuration
systemd-timesyncd.service            loaded active running Network Time Synchronization
systemd-udevd.service                loaded active running Rule-based Manager for Device Events
and Files
systemd-userdbd.service              loaded active running User Database Manager
user@0.service                       loaded active running User Manager for UID 0
wpa_supplicant.service               loaded active running WPA supplicant

```

Legend:

- 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.

23 loaded units listed.

System Information & Overview

You can check basic system information on the Nitrogen95 SMARC Evaluation Kit, including details such as the CPU type, usage, load, available memory, storage space, uptime, and software version. The example below shows the output from commands like `lscpu` , `free -h` , `df -h` , `uptime` , and `cat /etc/os-release` run on the device.

```

root@b2qt-nitrogen95:~# lscpu
Architecture:          aarch64
  CPU op-mode(s):      32-bit, 64-bit
  Byte Order:          Little Endian
CPU(s):                6
  On-line CPU(s) list: 0-5
Vendor ID:             ARM
  Model name:          Cortex-A55
  Model:               0
  Thread(s) per core:  1
  Core(s) per cluster: 6
  Socket(s):           -
  Cluster(s):          1
  Stepping:            r2p0
  CPU(s) scaling MHz:  64%
  CPU max MHz:         1800.0000
  CPU min MHz:         500.0000
  BogoMIPS:            48.00
  Flags:               fp asimd evtstrm aes pmull sha1 sha2 crc32 atomics fphp asimdhp cpuid asimdrrm lrcpc
dcpop asimdnp
Caches (sum of all):
  L1d:                 192 KiB (6 instances)
  L1i:                 192 KiB (6 instances)
  L2:                  384 KiB (6 instances)
  L3:                  512 KiB (1 instance)
Vulnerabilities:
  Gather data sampling: Not affected
  Itlb multihit:       Not affected
  L1tf:                Not affected
  Mds:                 Not affected
  Meltdown:            Not affected
  Mmio stale data:     Not affected
  Reg file data sampling: Not affected
  Retbleed:            Not affected
  Spec rstack overflow: Not affected
  Spec store bypass:   Not affected
  Spectre v1:          Mitigation; __user pointer sanitization
  Spectre v2:          Not affected
  Srbds:               Not affected
  Tsx async abort:     Not

root@b2qt-nitrogen95:~# free -h
              total        used        free      shared  buff/cache   available
Mem:          7.5Gi        542Mi        6.9Gi         11Mi        258Mi        7.0Gi
Swap:          0B           0B           0B

root@b2qt-nitrogen95:~# df -h
Filesystem      Size      Used Available Use% Mounted on
/dev/root       4.2G      2.2G      1.7G   56% /
devtmpfs        3.3G      4.0K      3.3G    0% /dev
tmpfs           3.8G        0        3.8G    0% /dev/shm
tmpfs           1.5G     10.0M      1.5G    1% /run
tmpfs           3.8G      4.0K      3.8G    0% /tmp
tmpfs           3.8G     32.0K      3.8G    0% /var/volatile
/dev/mmcblk0p1  59.0M     35.5M     23.5M   60% /run/media/boot-mmcblk0p1
tmpfs          768.9M     68.0K     768.8M    0% /run/user/0

root@b2qt-nitrogen95:~# uptime
 14:56:54 up 11 min,  1 user,  load average: 0.81, 1.08, 0.71

root@b2qt-nitrogen95:~# cat /etc/os-release

```

```
ID=ezurio-b2qt
NAME="Ezurio b2qt"
VERSION="5.0.4 (scarthgap)"
VERSION_ID=5.0.4
VERSION_CODENAME="scarthgap"
PRETTY_NAME="Ezurio b2qt 5.0.4 (scarthgap)"
CPE_NAME="cpe:/o:openembedded:ezurio-b2qt:5.0.4"
```

Important Git Repository and Sources

- Boundary Devices → `boundary-bsp-platform` : <https://github.com/boundarydevices/boundary-bsp-platform/tree/ezurio-imx-6.6.52-2.2.1>,
- Boundary Devices → `meta-boundary` : <https://github.com/boundarydevices/meta-boundary/tree/scarthgap>,
- Boundary Devices → `linux` : <https://github.com/boundarydevices/linux/tree/ezurio-lf-6.6.y>,
- Boundary Devices → `u-boot` : https://github.com/boundarydevices/u-boot/tree/ezurio-lf_v2024.04,
- Ezurio → `meta-summit-radio` : <https://github.com/Ezurio/meta-summit-radio/tree/lrd-13.24.0.x>.

BSP Support, Drivers & Configs

- U-Boot Defconfig: https://github.com/boundarydevices/u-boot/blob/ezurio-lf_v2024.04/configs/imx95_nitrogen_smarc_defconfig.
- Linux Device Tree(s): <https://github.com/boundarydevices/linux/tree/ezurio-lf-6.6.y/arch/arm64/boot/dts/freescale>. Search for `imx95-nitrogen-smarc`, in this case.
- Linux Device Tree Overlay(s): `imx95-nitrogen-smarc-dsi.dtbo` + `imx95-nitrogen-smarc-nx611.dtbo`.
- Sona NX611 is fully supported through our Yocto/OpenEmbedded Layers: <https://github.com/Ezurio/meta-summit-radio/tree/lrd-13.24.0.x>.

Updating & Customizing your Bootloader & OS

U-Boot

For more information, please refer to <https://www.ezurio.com/resources/software-announcements/u-boot-v2022-04-for-i-mx-platforms>. The latest binaries can be found at [u-boot-images-2022.04](#) and [u-boot-images-2024.04](#), while the source code is available on GitHub under github.com/boundarydevices/u-boot.

If you're unsure which defconfig to download, you can check the current configuration from the U-Boot prompt using:

```
printenv uboot_defconfig
```

For the Nitrogen95 SMARC module it should always be `imx95_nitrogen_smarc`.

Yocto

To ensure reproducible Yocto builds, we recommend using our (Ubuntu-based) Docker Containers whenever possible: <https://www.ezurio.com/resources/software-announcements/using-docker-containers-for-reproducible-yocto-builds>.

Boot to Qt | Qt 6.8.1

Please refer to <https://lairdcp.github.io/guides/Boot2Qt-Scarthgap-Release-for-iMX-Platforms/1.0/Boot2Qt-Scarthgap-Release-for-i.MX-Platforms.html> for more information.

Scarthgap

Please refer to <https://lairdcp.github.io/guides/yocto-scarthgap-release-for-imx-platforms/1.0/Yocto-Scarthgap-Release-for-i.MX-Platforms.html> for more information.

Debian & Ubuntu

Not supported. For additional information, please contact your local sales representative or FAE.

Android (15 / 16)

We plan to introduce support for Android in an upcoming version and feature release. If you have an urgent need for your current project and product, please get in touch with us — our team will be happy to discuss your specific case. Visit <https://www.ezurio.com/contact>.

QNX (SDP 7.1 / 8.0)

We plan to introduce support for QNX in an upcoming version and feature release. If you have an urgent need for your current project and product, please get in touch with us — our team will be happy to discuss your specific case. Visit <https://www.ezurio.com/contact>.

FreeRTOS / NXP MCUXpresso SDK (2.16.0)

We plan to introduce support for FreeRTOS / the NXP MCUXpresso SDK in an upcoming version and feature release. If you have an urgent need for your current project and product, please get in touch with us — our team will be happy to discuss your specific case. Visit <https://www.ezurio.com/contact>.

J1 is the reserved JTAG connector, marked as DND (not fitted by default) on the Nitrogen95 SMARC module. You can populate it manually, if needed. For detailed pinout information and a list of compatible parts, refer to the **SMARC 2.1 Hardware Specification**, section 3.24, page 65: https://sget.org/wp-content/uploads/2020/03/SMARC_V21-specification.pdf. The JTAG I/O voltage and interface operate at 1.8 V.

Buildroot

2025.02

TBD.

2024.02

TBD.

Additional Features & Information

Wi-Fi and Bluetooth / BLE Usage

To explore additional features and learn how to set up, bring up and use the internal Wi-Fi and BLE radio of the Sona NX611 module, for example, see <https://lairdcp.github.io/guides/yocto-scarthgap-release-for-imx-platforms/1.0/Yocto-Scarthgap-Release-for-i.MX-Platforms.html>.

Arducam xISP – IMX678 Camera Usage

Coming soon (in the next few weeks) ...

Recovery Instructions

If your Nitrogen95 SMARC development board isn't powering on or showing any signs of life, you may want to try recovering *both* the bootloader and operating system using **NXP's Universal Update Utility (UUU)**. A step-by-step guide is available here: <https://www.ezurio.com/resources/software-announcements/recovering-i-mx-platforms-using-uuu>.

Before that, make sure to double-check the following: (a) There are no visible signs of hardware damage – inspect all components carefully; (b) the Nitrogen95 SMARC module is properly seated in the SMARC socket slot (J1) of the Universal SMARC Carrier Board; (c) cables and connections are securely in place – nothing should be loose or jammed; (d) all boot switches on the Universal SMARC Carrier Board (S1) are in OFF position; and (e) SW1 on the Nitrogen95 SMARC module itself is also set to OFF .

Troubleshooting

Known Issues

1. Bluetooth not working: If you encounter an error message such as [279.259014] Bluetooth: hci0: Frame reassembly failed (-84) repeatedly appearing in the debug terminal, try restarting or resetting the device. Then, at the **U-Boot prompt**, enter `setenv dtbos "imx95-nitrogen-smarc-dsi.dtbo imx95-nitrogen-smarc-nx611.dtbo"` followed by `saveenv` . This manually applies and saves the correct device tree. You only have to do it once.

References

1. (Boundary Devices) Wiki → https://bdwiki.ezurio.com/index.php/Nitrogen95_SMARC,
2. (Ezurio) GitHub SOM Documentation → <https://lairdcp.github.io/soms>,
3. (Ezurio) Software Releases → <https://www.ezurio.com/resources/software-announcements>,
4. (Arducam) Documentation → <https://docs.arducam.com>,
5. (NXP) i.MX 95 Applications Processor Family → <https://www.nxp.com/products/i.MX95>,
6. (NXP) IW611 Chipset → <https://www.nxp.com/products/IW611>,
7. (Buildroot Project) Documentation → <https://buildroot.org/docs.html>,
8. (Yocto Project) Documentation → <https://docs.yoctoproject.org>,
9. (SGeT Consortium) SMARC Standard → <https://sget.org/standards/smarc>,
10. (Docker) Documentation → <https://docs.docker.com>,
11. (Qt & Boot2Qt) Documentation → <https://doc.qt.io/Boot2Qt> + <https://doc.qt.io>.

Changelog

- Public Version 1.0 – 24/10/2025 (Florian Baumgartl): Initial release based on #P/N EZSML-959-0816-00158-2-K2 REV 1.0.

Additional Information

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