

MC OpenWrt 2.0.9 “Road Runner”

MC Technologies is proud it release version 2.0.9 codename “Road Runner”. It is the first stable release based on the OpenWrt 21 version.

Upgrades from 1.X (based on OpenWrt 19) to 2.X are not supported. If this is required, please contact your sales representative or contact cellulare@mc-technologies.net.

Highlights

A/B Partitioning

Starting with OpenWRT 2.0.9 we are introducing A/B Partitioning with an Overlay Partition for User-Data. Older versions had a recovery partition and one for all data – user-data as well as software. With 2.0.9. we have two copies of the software partitions, which are read-only (A/B partitioning).

When installing a system upgrade, the other software-partition is updated (when A is booted, B is updated and vice versa), then the updated partition is booted on the next boot. This allows for easier recovery when an upgrade failed or introduced bugs or failures.

The overlay-partition is laid over the currently bootet software partition and contains all changes to the root-partitions, including configuration changes, installed packages or other files like certificates. This partition is left intact when the system is upgraded, so user-changes are kept.

libc change from musl to glibc

OpenWRT 2.0.9 now uses the GNU-libc (glibc), instead of the musl-libc. OpenWrt chose musl due to its minimal size compared to glibc, but it lacks the throughput of glibc in some circumstances. Our device usually have big enough storage and RAM, so we chose glibc for its better performance.

Internal GPIOs were renamed

The onboard GPIOs could until now be found under `/sys/mc100_gpios/`. From 2.0.9 onwards the internal GPIOs are managed by the Linux Kernel and can be found under `/sys/class/gpio`, namely:

- IN1 – `/sys/class/gpio/mc100:in1`
- IN2 – `/sys/class/gpio/mc100:in2`
- OUT1 – `/sys/class/gpio/mc100:out1`
- OUT2 – `/sys/class/gpio/mc100:out2`

The file `value` is used to read the current value from the GPIO pin or to write a value for the outputs.

The paths for SenST2 and GPIO-extension boards are unchanged (`/sys/senst2_board/` and `/sys/gpio_board/`).

LED Configuration

The LEDs are now user-configurable with the Web Interface LuCi. They can for example be set to a heartbeat or network activity for a specific device. Also the LED 4 shows whether the device is booted successfully by showing a heartbeat pattern.

The paths to the LEDs have changed, like with the GPIOs from `/sys/mc100_leds/` in the OpenWrt 19 based systems, to `/sys/class/led` starting with this release going forward.

Support for Java added

Support for Java software has been added with the AdoptOpenJDK binaries. Using these packages, Java programs can be run on the OpenWrt based devices, like on any other Linux based systems.

Updated Software

This upgrade include many fixed bugs, solved vulnerabilities and increased performance. Some notable packages and their versions in this release:

- Linux-Kernel – 5.4.154
 - with backports for wireguard VPN
- glibc – 2.33-3
- openssl – 1.1.1l
- NodeRed – 2.2.2-1
- Node.JS – 14.18.1-1
- AdoptJDK – 11.0.11+9

Known Issues

- On first connect to the webserver, the user will be asked to accept the self-signed certificate. The data stream will be encrypted, but the certificate is self-generated and self-signed, so it is not trusted by the users Operating System.

Upgrading from 2.0.8 or before (only 2.x-line)

Customers running the test system 2.0.8 or before can upgrade their installation to the stable 2.0.9 version. Most customers will want to install the full-image, including NodeRed and other software. Unfortunately a bug in the web-based updater prevents installation of the full-image directly. First, upgrade to a cut-down version of the software. This package does not include NodeRed and is essentially a bare-bones system, but allows to upgrade to a full-image via the web-based updater.

A different way to install the current image is via a Terminal/Command Prompt (SSH or Serial Connection). Upload the full-image from a PC to the device and run the `sysupgrade` command like so:

```
1 scp full-v2.0.9-rootfs.tar.gz root@192.168.2.1:/tmp/  
2 # failing that, try:  
3 # cat full-v2.0.9-rootfs.tar.gz | ssh root@192.168.2.1 "cat - > ↵  
    /tmp/full-v2.0.9-rootfs.tar.gz"  
4 ssh root@192.168.2.1  
5 cd /tmp  
6 sysupgrade full-v2.0.9-rootfs.tar.gz
```

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