

Consistent USB device naming in a FreeNAS jail

How to make an Aeotec Z-Wave Z-Stick, a CC2531 Zigbee2MQTT, and an RFLink work with a FreeNAS jail running Domoticz

My current home server is a FreeNAS^[1] with a bunch of jails and plugins; one of these is Domoticz. While I barely do anything above collecting sensor data with it, I still had to make it work with RFLink^[2], Zigbee2MQTT^[3], and an Aeotec Z-Stick Gen 5^[4].

I'm not going into the installation of Domoticz on FreeNAS, there are excellent tutorials on the iX Community forums:

- [HOWTO] Domoticz and open-zwave in a FreeNAS 11 jail!^[5]
- Install script for Domoticz with open-zwave driver in iocage jail ^[6]

Note: zigbee2mqtt is a node.js daemon; I'm using pm2^[7] to run it.

iocage hooks

The `iocage` jail controller has some hooks that can run scripts on the host for the jail. The two hooks needed in this case are the `exec_poststart` and `exec_prestart` hooks. The prestart runs before the jails is created; the post start runs once the jail filesystem is up, but nothing is started yet.

My ZFS dataset for the iocage is called `server`. Modify the paths according to that, and create the `bin` directory on it.

```
/mnt/server/bin/domoticz-prestart.sh
```

```
#!/bin/bash

# add devfs rules to allow USB devices to be seen from within
domoticz
if ! grep -q "devfsrules_jail=5" /etc/devfs.rules; then
    cat <<"EOF" >> /etc/devfs.rules

[devfsrules_jail=5]
add include $devfsrules_hide_all
add include $devfsrules_unhide_basic
add include $devfsrules_unhide_login
add path zfs unhide
add path 'tty*' unhide
add path 'ugen*' unhide
add path 'cu*' unhide
add path 'usb/*' unhide
EOF
    /usr/sbin/service devfs restart
fi
```

bash

```
/mnt/server/bin/domoticz-poststart.sh
```

```
#!/bin/bash

function get_tty () {
    local vendor="${1}"
    local product="${2}"
```

bash

```

# return the tty{} value, eg; U2
sysctl dev.umodem | grep "vendor=${vendor} product=${product}" | sed -r 's/. *ttyname=([\s]+) .*/\1/'
}

function create_symlink () {
    local source="${1}"
    # failsafe
    if [ "${source}" == 'tty' ]; then return; fi
    local target="/mnt/server/iocage/jails/domoticz/root/dev/${2}"
    if [ -e "${target}" ]; then rm -f "${target}"; fi
    ln -s "${source}" "${target}"
}

# rflink is an arduino mega
create_symlink "tty$(get_tty '0x2341' '0x0010')" "ttyUrflink"
# zigbee is a Texas Instrument CC2531
create_symlink "tty$(get_tty '0x0451' '0x16a8')" "ttyUzigbee"
# zwave is a Z-Stick Gen 5
# note: it needs the 'cua' device in domoticz, not the tty
device
create_symlink "cua$(get_tty '0x0658' '0x0200')" "cuaUzwave"

```

Note: these commands are meant to be ran *after* domoticz was successfully installed in a jail named **domoticz**

```

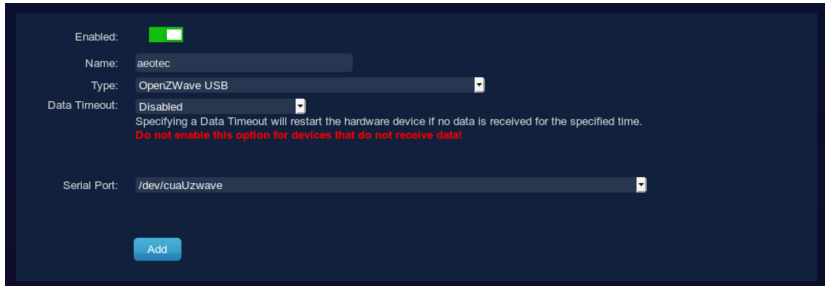
chmod 0755 /mnt/server/bin/domoticz-poststart.sh
chmod 0755 /mnt/server/bin/domoticz-prestart.sh
iocage stop domoticz
iocage set exec_poststart=/mnt/server/bin/domoticz-
poststart.sh domoticz
iocage set exec_prestart=/mnt/server/bin/domoticz-prestart.sh
domoticz
iocage set devfs_ruleset=5 domoticz
iocage start domoticz

```

bash

Hardware configurations inside domoticz

Z-wave



Enabled:

Name: aeotec

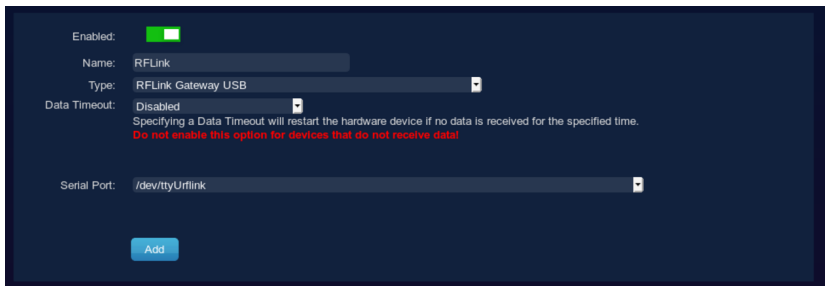
Type: OpenZWave USB

Data Timeout: Disabled
Specifying a Data Timeout will restart the hardware device if no data is received for the specified time.
Do not enable this option for devices that do not receive data!

Serial Port: /dev/cuaUzwave

Domoticz hardware configuration for aeotec z-wave stick with path of cuaUzwave

RFLink



Enabled:

Name: RFLink

Type: RFLink Gateway USB

Data Timeout: Disabled
Specifying a Data Timeout will restart the hardware device if no data is received for the specified time.
Do not enable this option for devices that do not receive data!

Serial Port: /dev/ttyUrflink

Domoticz hardware configuration for rflink with path of ttyUrflink

Enabled:

Name: zigbee2mqtt

Type: Zigbee2MQTT

Data Timeout: Disabled
Specifying a Data Timeout will restart the hardware device if no data is received for the specified time.
 Do not enable this option for devices that do not receive data!

Plugin to add support for zigbee2mqtt project

Specify MQTT server and port.

Automatically creates Domoticz devices for connected device.

MQTT Server address: 127.0.0.1

Port: 1883

MQTT Username (optional):

MQTT Password (optional):

MQTT Client ID (optional):

Zigbee2Mqtt Topic: zigbee2mqtt

Zigbee pairing: Disabled

Debug: False

Domoticz hardware configuration for zigbee2mqtt

`/opt/zigbee2mqtt/data/configuration.yaml`

```
homeassistant: false
permit_join: false
mqtt:
  base_topic: zigbee2mqtt
  server: 'mqtt://localhost'
serial:
  port: /dev/ttyUzigbee
advanced:
  channel: 25
```

yaml

Caveats

There's a weird behaviour of the CC2531 for which I haven't found a reason or a fix for: after being plugged in, on the very first start the tty interface shuts down and gets reassigned to another position, eg. from `ttyU0` it becomes `ttyU4`. I've tried using `devd` rules to trigger a restart of domoticz or a recreation of the symlink, but so far, none of them provided good results. I'm not completely happy with the zigbee2mqtt project anyway, because it requires a separate node.js daemon to run in the background - one more moving element -, therefore I'm not too keen to find a fix. Instead I'll probably look into alternatives, like the dresden elektronik ConBee[®]

Links

1. <https://www.freenas.org/>
2. <http://rflink.nl/blog2/>
3. <https://www.zigbee2mqtt.io>
4. <https://aeotec.com/z-wave-usb-stick/>
5. <https://www.ixsystems.com/community/threads/howto-domoticz-and-open-zwave-in-a-freenas-11-jail.61030/>
6. <https://www.ixsystems.com/community/threads/install-script-for-domoticz-with-open-zwave-driver-in-iocage-jail.62254/>
7. <https://pm2.keymetrics.io/>
8. <https://www.amazon.co.uk/dp/B07PZ7ZHG5/>

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