



NanoStation 2 Configuration Guide

Version: V1.0

2010-12-27

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Setting up a SuperNode with an Ubiquiti NS2

Introduction

The Nanostation 2 is the gateway node for the mesh and will also run the batman visualisation server that Afrimesh will draw info from.

Flashing the Nanostation 2

Download images for the Nanostations 2 at:

http://www.atcom.cn/downloads/WiFi_Mesh_ATA/Firmware/ubnt2/openwrt-at-heros-ubnt2-squashfs.bin

http://www.atcom.cn/downloads/WiFi_Mesh_ATA/Firmware/ubnt2/openwrt-at-heros-ubnt2-vmlinux.lzma

There are two ways to re-flash the Nanostation 2.

1. Steps to re-flash using Windows XP or Vista:

1) You'll need to install a utility program called Winpcap. Get it here:

<http://www.winpcap.org/install/default.htm>

2) Download and save the flash utility at:

<http://dev.open-mesh.com/downloads/testing/firmware/open-mesh-flash.exe>

This is a "console" application, so open up a console window (in Vista, just type "command" in the search box in the start menu), then go to the location you saved the flash utility above and type "open-mesh-flash":

```
C:\>open-mesh-flash.exe
Usage:
open-mesh-flash.exe [ethdevice] flashes embedded kernel + rootfs or
ubiquiti image: open-mesh firmware r2695
open-mesh-flash.exe [ethdevice] rootfs.bin kernel.lzma flashes your rootfs
and kernel
open-mesh-flash.exe [ethdevice] ubnt.bin flashes your ubiquiti image
```

open-mesh-flash.exe -v prints version information

The 'ethdevice' has to be one of the devices that are part of the supported device list which follows.

You can either specify its name or the interface number.

1: \Device\NPF_{AB0356CB-A49B-40A6-B6F8-6CFC3E8BF620}
(Description: Microsoft)

2: \Device\NPF_{D124907B-D56D-48AB-A7E1-D0FFB63D61ED}
(Description: Realtek PCIe GBE Family Controller)

3) Plug in AC power now into the power supply or passive POE injector. Immediately press and hold the reset button (near the Ethernet jack - might require a small screw driver) for about 7 seconds. The LEDs will flash in sequence letting you know the device is ready to accept new firmware.

4) Then type "open-mesh-flash n" where "n" is the Ethernet Device number. Note the number of your actual Ethernet Device from the list displayed (in this case, "2").

Note: Make sure the device is connected to your computer via Ethernet. The flash should start in a few seconds.

Here is a sample output - yours should look similar:

```
C:\>open-mesh-flash 2

Peer MAC: 00:12:cf:c9:3c:ed
Peer IP : 192.168.0.1
Your MAC: 00:ba:be:ca:ff:ee
Your IP : 192.168.0.0
A flash size of 8 MB was detected.
rootfs(0x006a0000) + kernel(0x00100000) + nvram(0x00000000) sums
up to 0x007a0000 bytes
Setting IP address...
Loading rootfs...
Sending rootfs, 4096 blocks...
Initializing partitions...
Rootfs partition size now 0x006b0000
Flashing rootfs...
Loading kernel...
Sending kernel, 1408 blocks...
Flashing kernel...
```

```
Setting boot_script_data...  
Done. Restarting device...
```

Note: The re-flash will take about 3-5 minutes to complete.

2. Steps to re-flash using Linux:

- 1) Boot your Linux computer (or Live CD) and bring up a terminal window (under "Applications", then "Accessories", then "terminal" on Ubuntu).
- 2) Make sure it is connected to the internet, then type the following to download the files you will need:

```
sudo apt-get update  
sudo apt-get install wget  
wget http://dev.open-mesh.com/downloads/stable/firmware/open-mesh-f  
lash  
chmod +x open-mesh-flash
```

- 3) Type: `sudo ./open-mesh-flash`. You should see something like:

```
Usage:  
./open-mesh-flash [ethdevice]  flashes embedded kernel + rootfs:  
open-mesh firmware r2643  
./open-mesh-flash [ethdevice] rootfs.bin kernel.lzma  flashes your rootfs  
and kernel  
./open-mesh-flash -v  prints version information
```

The 'ethdevice' has to be one of the devices that are part of the supported device list which follows. You can either specify its name or the interface number.

- 1: eth0
(No description available)
- 2: wmaster0
(No description available)
- 3: wlan0
(No description available)
- 4: any
(Description: Pseudo-device that captures on all interfaces)
- 5: lo
(No description available)

4) Plug in AC power now into the power supply or passive POE injector. Immediately press and hold the reset button (near the Ethernet jack - might require a small screw driver) for about 7 seconds. The LEDs will flash in sequence letting you know the device is ready to accept new firmware.

5) Then type "open-mesh-flash n" where "n" is your Ethernet Device number. Note the number of your actual Ethernet Device from the list displayed (in this case, "1").

Note: Make sure the device is connected to your computer via Ethernet. The flash should start in a few seconds.

Here is a sample output - yours should look similar:

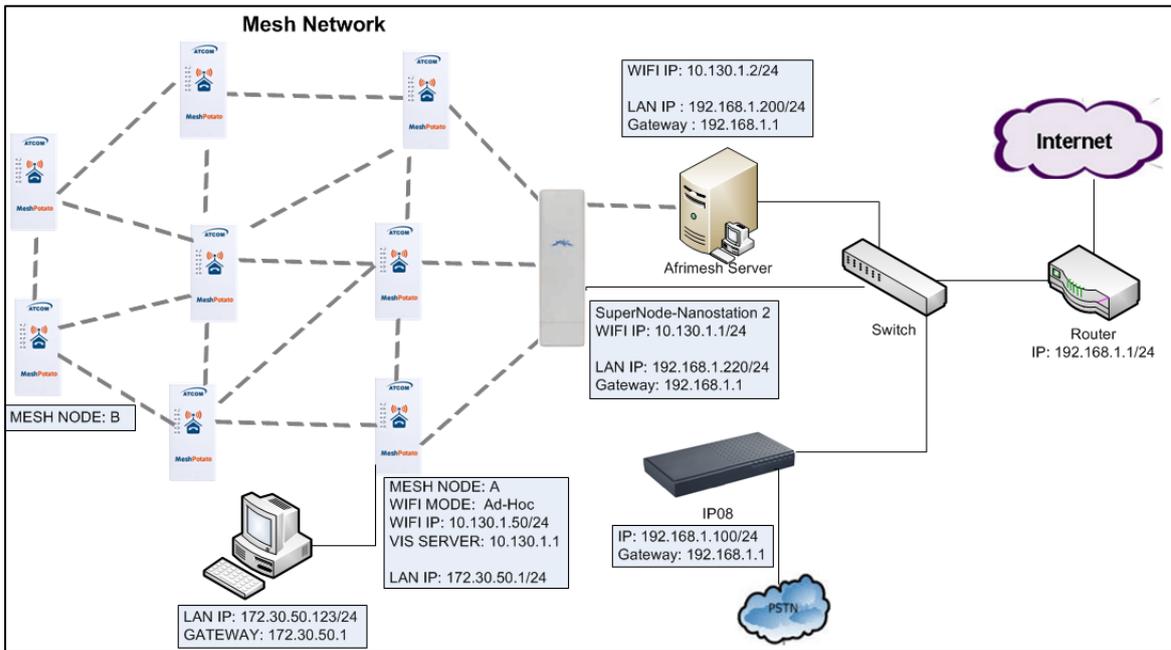
```
A flash size of 8 MB was detected.
Peer MAC: 00:18:84:80:67:1C (this will be the MAC address of your
router)
You MAC: 00:ba:be:ca:ff:ee
Your IP: 192.168.1.0
Setting IP address...
Loading rootfs...
Sending rootfs. 4096 blocks...
Initializing partiions...
Rootfs partition size now 0x006f0000
Flashing rootfs...
Loading Kernel...
Sending kernel, 1408 blocks...
Flashing Kernel...
Setting boot_script_data...

Done. Restarting device...
```

6) This will take 3-5 minutes.

Set up NS2 to be a supernode

We can use Nanostation 2 as a supernode in the mesh network. It is a visualisation server. The following network topology shows its application scenario.



Gateway Mesh Node (NS2) Configuration

After re-flashing the NS2, the default LAN IP of Nanostation 2 is 192.168.10.20. Use telnet 192.168.10.20 (no password) until you set the root password via the GUI or the command line:

```
$ telnet 192.168.10.20
root@OpenWrt:~# passwd
```

After you set the root password telnet will be disabled and ssh enabled:

```
$ ssh root@192.168.10.20
root@OpenWrt:~#
```

Edit /etc/config/network to reflect the following settings:

```
option 'ipaddr' '192.168.1.220'
option 'gateway' '192.168.1.1'
option 'dns' '192.168.1.1'
```

Configuring your MP01s

MPs should almost work out of the box but we had to make some changes.

1) You need to make sure that the files in the /etc/config directory are writable:

```
$ chmod 0666 /etc/config/*
```

2) In /etc/config/batmand make sure that batmand.routing_class is set to '1' or '2'

3) Finally point the visualisation server to the NS2 e.g.

```
batmand.visualisation_srv '10.130.1.1'
```

Setting up Afrimesh

You should install the Afrimesh software before visualize the mesh nodes. For more detailed configuration, please refer to [ATCOM MP01 Administrator Manual V1.0.pdf](#).

Note: you should have an NS2 as your mesh gateway and you should be able to visualise the mesh on Afrimesh server via the Afrimesh software.

Reference

<http://www.atcom.cn>

<http://support.open-mesh.com/activekb/questions.php?questionid=24>

http://wiki.villagetelco.org/index.php?title=Mesh_Potato_HOWTOs#Setting_up_a_SuperNode_with_an_Ubiquiti_NS2