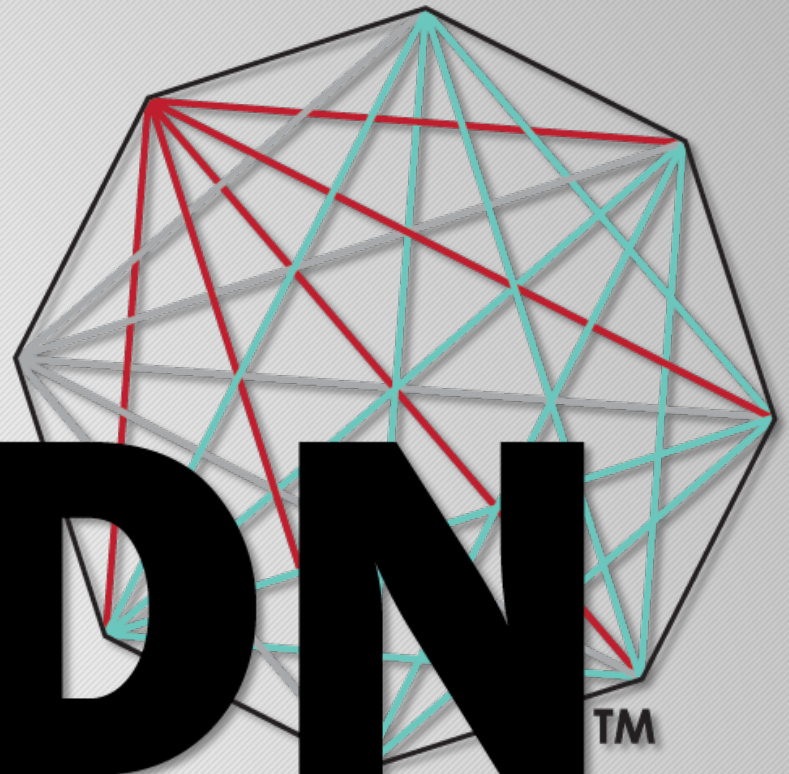

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Installation Steps

FLARC Webinar

Randy Smith, WU2S

April 2019

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High-Speed Multi-Media Mesh Network

Keep your data moving when the lights go out

Video Conference Courtesy

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Please leave your microphone on MUTE

Use the CHAT window to ask a question

Controls are at the bottom of the video window

Firmware Installation

There are two cases for installing AREDN® firmware:

1. If you already have an existing version of AREDN® running on your device, then you can use your computer's web interface to navigate to **Setup > Administration > Firmware Update** to install your new firmware.

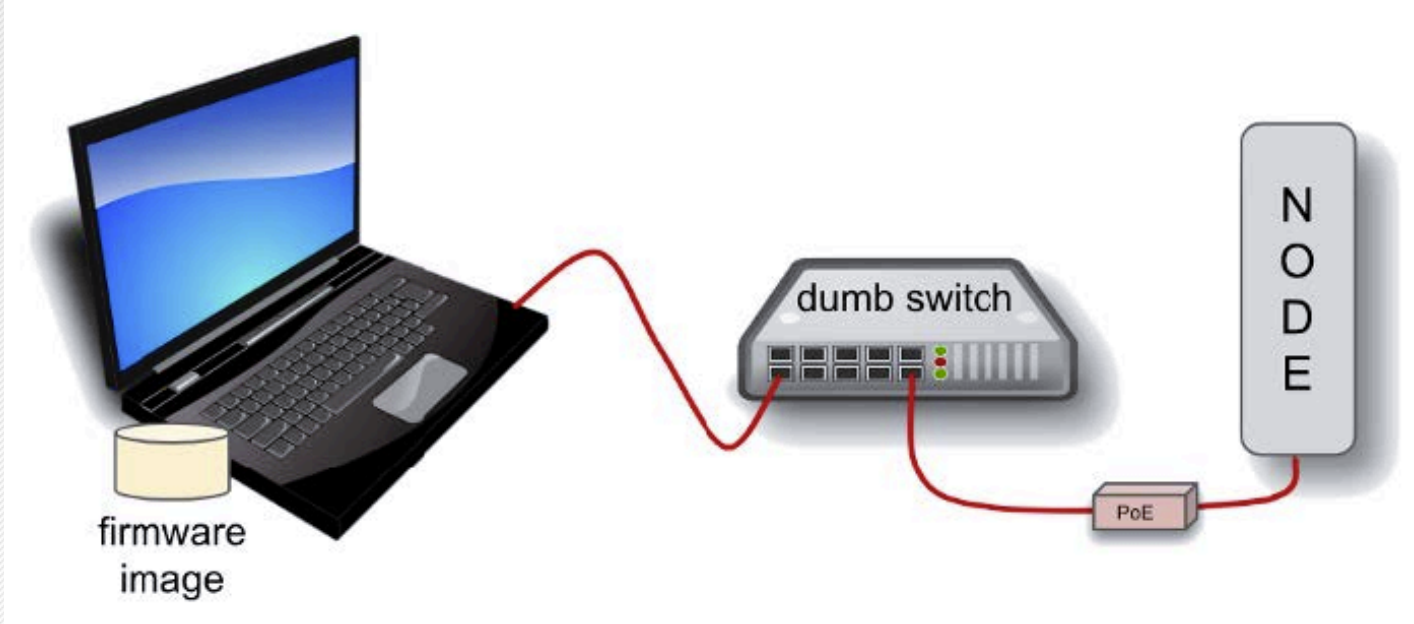
2. If you are installing AREDN® firmware on a device for the first time, each hardware platform may require a unique procedure.

Firmware Installation

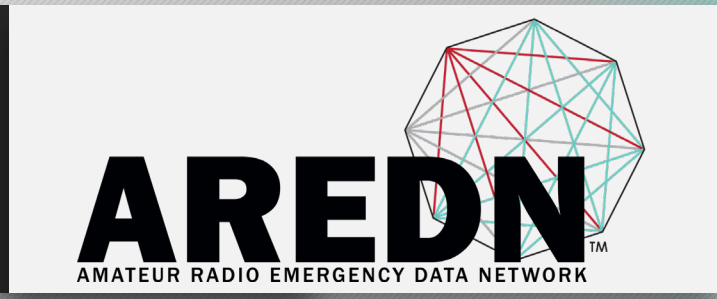
We will start with Case 2, the first-time installation of AREDN® firmware to replace the factory firmware.

Initial Firmware Installation Prep

The diagram shows that your computer with the downloaded firmware image must be connected to the node using Ethernet cables in order to install the AREDN® image. It is strongly recommended to connect the computer and node through a simple Ethernet switch so that the switch can maintain the computer's link while the node is being rebooted.



Mikrotik Installation



Prerequisites

Preparation Steps

Install factory firmware replacement steps

Procedure is slightly different for Ubiquiti and TP-Link

Miktotik hAP ac lite

Indoors only but very versatile

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Model: RB952Ui-5ac2nD

Weight: 0.32 kg

Gain: 2 GHz = 1.5 dBi

5 GHz = 2 dBi

Current Price: = $48

Memory: = 64 Mb

Power Output: 2 GHz = 22 dBm

5 GHz = 23 dBm

Mikrotik First Install Process Pre-Req

Download **BOTH** the appropriate factory file (.elf) **AND** the sysupgrade file (.bin) for your device by following the instructions in the **Downloading AREDN Firmware** section of the AREDN online documentation

-OR-

Follow the instructions on the AREDN software download page at **http://downloads.arednmesh.org/firmware/ubnt/html/stable.html**

Mikrotik First Install Process Pre-Req

Your computer must run a TFTP/Bootp server in order to provide firmware images to Mikrotik nodes.

Mikrotik nodes require a two-part install process:

First, install and boot the factory (elf) file.

Second, use the in-memory-only AREDN® Administration UI to complete the installation of the sysupgrade (bin) file.

Windows TFTP Bootp Server Pre-Req

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You will need Tiny PXE software on your Windows computer. Download this software and extract it on your computer

Software is available from:

http://reboot.pro/files/file/303-tiny-pxe-server/

Documentation for Tiny PXE at:

http://mistyrebootfiles.altervista.org/documents/TinyPXEServer/files/pxesrv_about.htm

Mikrotik Preparation – Step 1
Windows Procedure

Download **BOTH** the appropriate Mikrotik factory and sysupgrade files.

Rename the factory file to **rb.elf** and keep the sysupgrade file available for later.

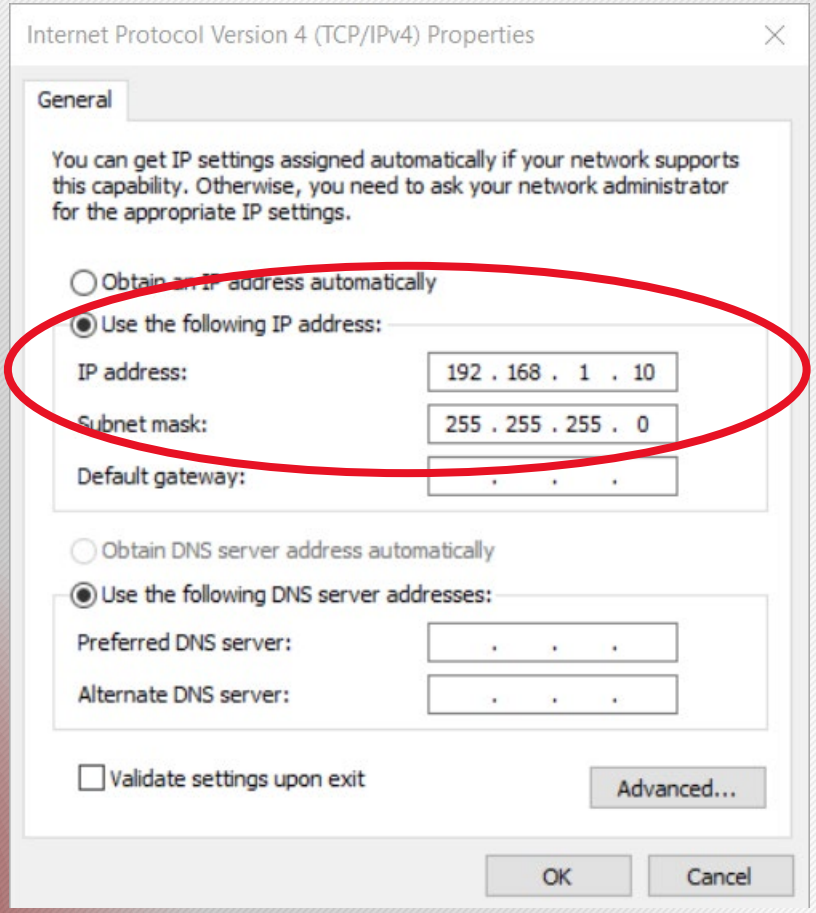
```
C:\AREDN>dir
 Volume in drive C has no label.
 Volume Serial Number is B0CF-DD6A

 Directory of C:\AREDN

04/04/2019  09:58 PM    <DIR>          .
04/04/2019  09:58 PM    <DIR>          ..
04/04/2019  09:54 PM         6,685,073 aredn-3.19.3.0-mikrotik-rb-nor-flash-16M-ac-sysupgrade.bin
04/04/2019  09:54 PM         8,839,912 aredn-3.19.3.0-mikrotik-vmlinux-initramfs.elf
04/04/2019  09:54 PM         8,839,912 rb.elf
               3 File(s)     24,364,897 bytes
               2 Dir(s)  213,706,461,184 bytes free

C:\AREDN>
```

Mikrotik Preparation – Step 2
Windows Procedure



Set your computer's Ethernet network adapter to a static IP address of 192.168.1.10 with a netmask of 255.255.255.0

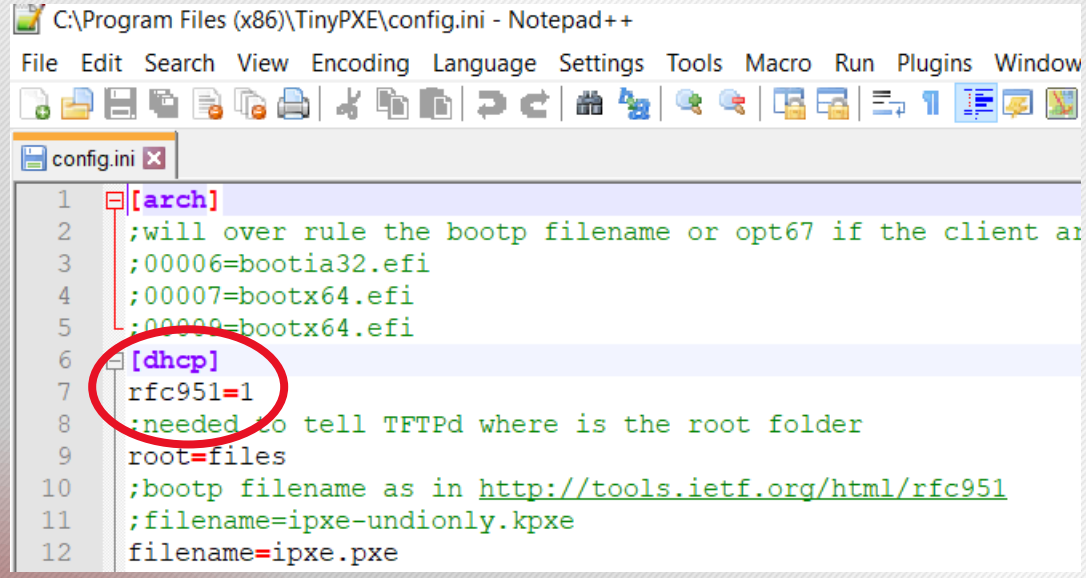
Turn **OFF** your computer's WiFi connection.

Mikrotik Preparation – Step 3
Windows Procedure

Connect an Ethernet cable from your computer to the switch, and another from the LAN port of the PoE adapter to the switch.

For a Mikrotik hAP ac Lite device, connect the Ethernet cable from Port 1 of the Mikrotik to the switch.

Mikrotik First Install Process - Step 1
Windows Procedure



Navigate to the folder where you extracted the Tiny PXE software and edit the **config.ini** file.

Directly under the **[dhcp]** tag, add the following line:
rfc951=1

then save and close the file

Mikrotik First Install Process - Step 2
Windows Procedure

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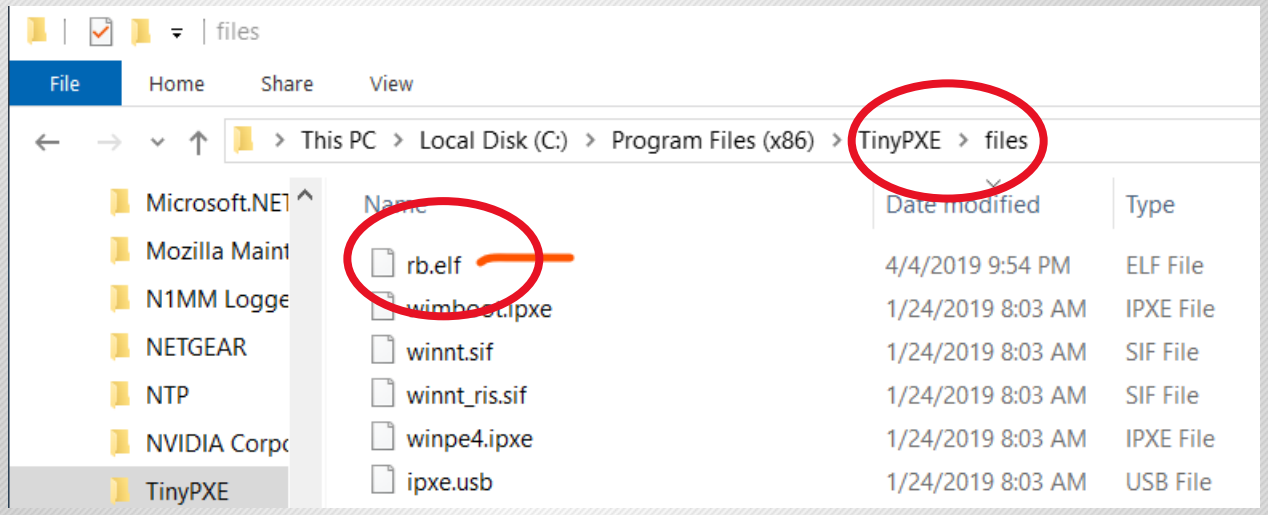
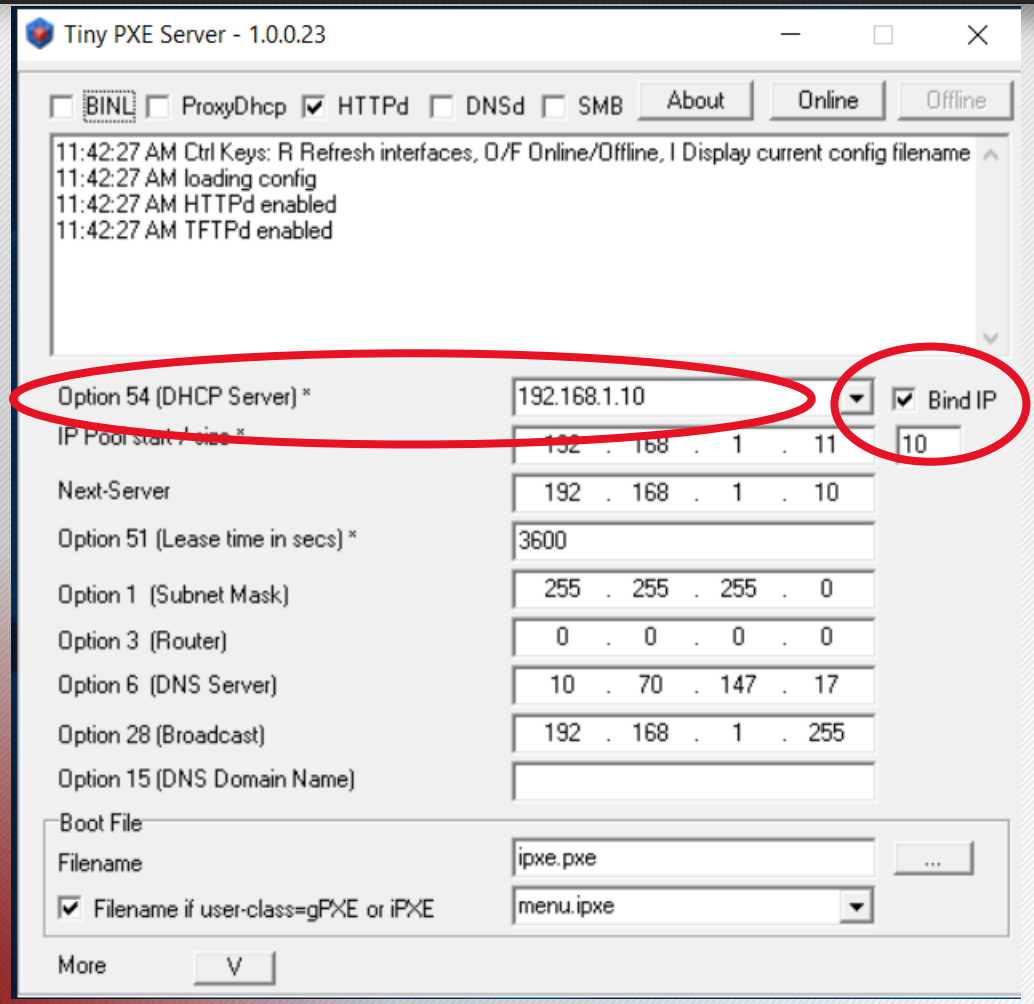
Copy the **rb.elf** file into the files folder under the Tiny PXE server directory location.



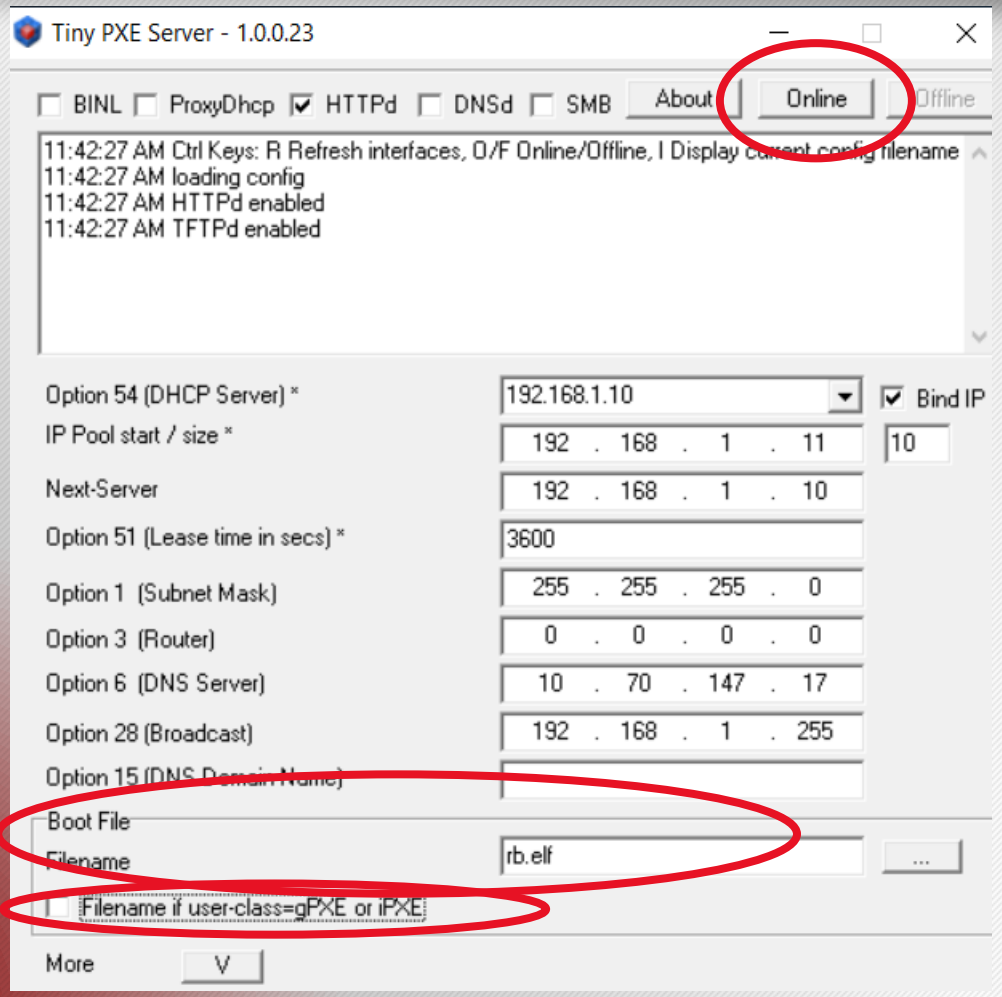
Mikrotik First Install Process - Step 3A
Windows Procedure



Start the Tiny PXE server exe and select your Ethernet interface IP from the dropdown list called **Option 54 [DHCP Server]**

Make sure to check the **Bind IP checkbox.**

Mikrotik First Install Process - Step 3B
Windows Procedure



Under the “Boot File” section, enter **rb.elf** into the the Filename field

Uncheck the checkbox for **Filename if user-class = gPXE or iPXE.**

Click the **Online** button at the top of the Tiny PXE window.

Mikrotik First Install Process - Step 4
Windows Procedure

With the **PoE unit powered off**, connect the Mikrotik node to the POE port.

If you are flashing a Mikrotik hAP ac lite device, connect the LAN cable from Port 1 of the Mikrotik to the dumb switch.

Mikrotik First Install Process - Step 5
Windows Procedure

You may want to consider using a foot switch to turn the power on and off.

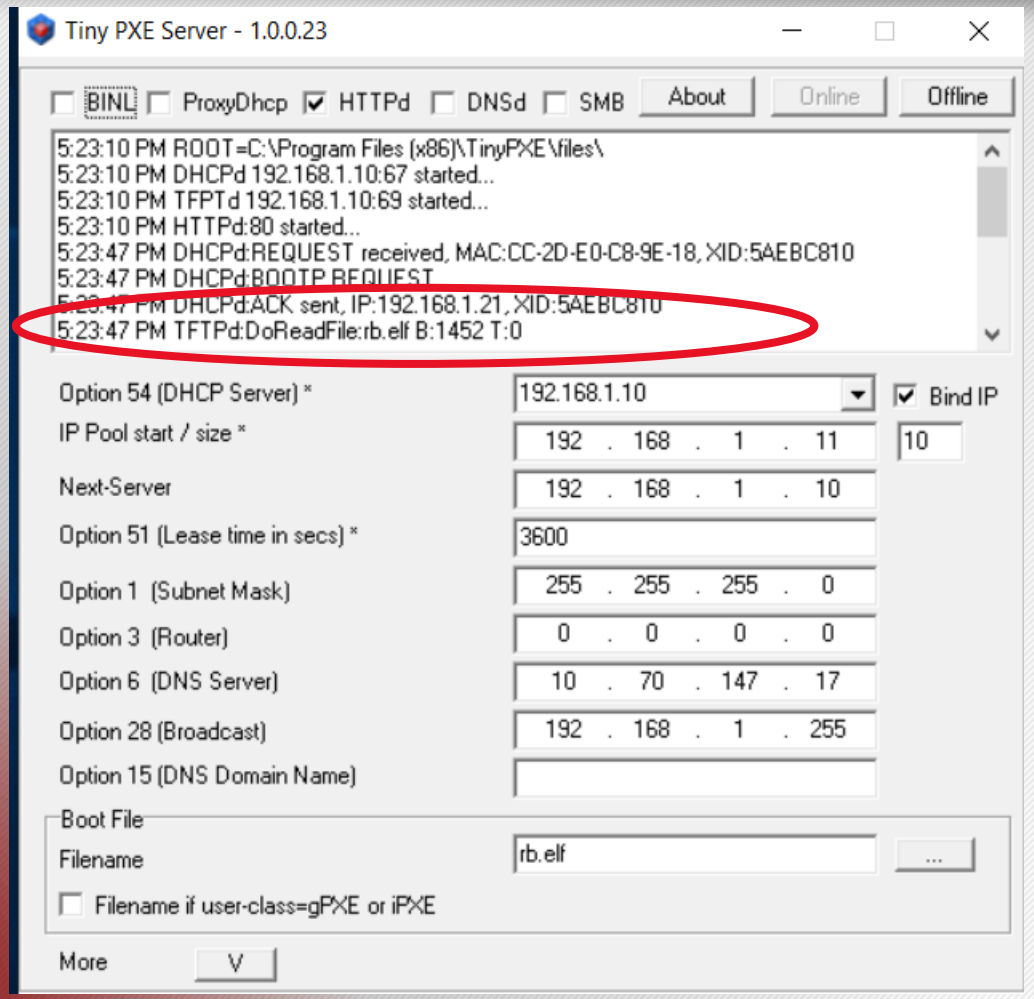
Holding a device and pressing the reset button on the node while powering on the PoE unit is awkward.

Mikrotik First Install Process - Step 6A
Windows Procedure

Press and hold the reset button on the node while powering on the PoE unit or the device.

Note that the toothpick probe pushing the reset button has a flat end rather than a point.

Mikrotik First Install Process - Step 6B
Windows Procedure

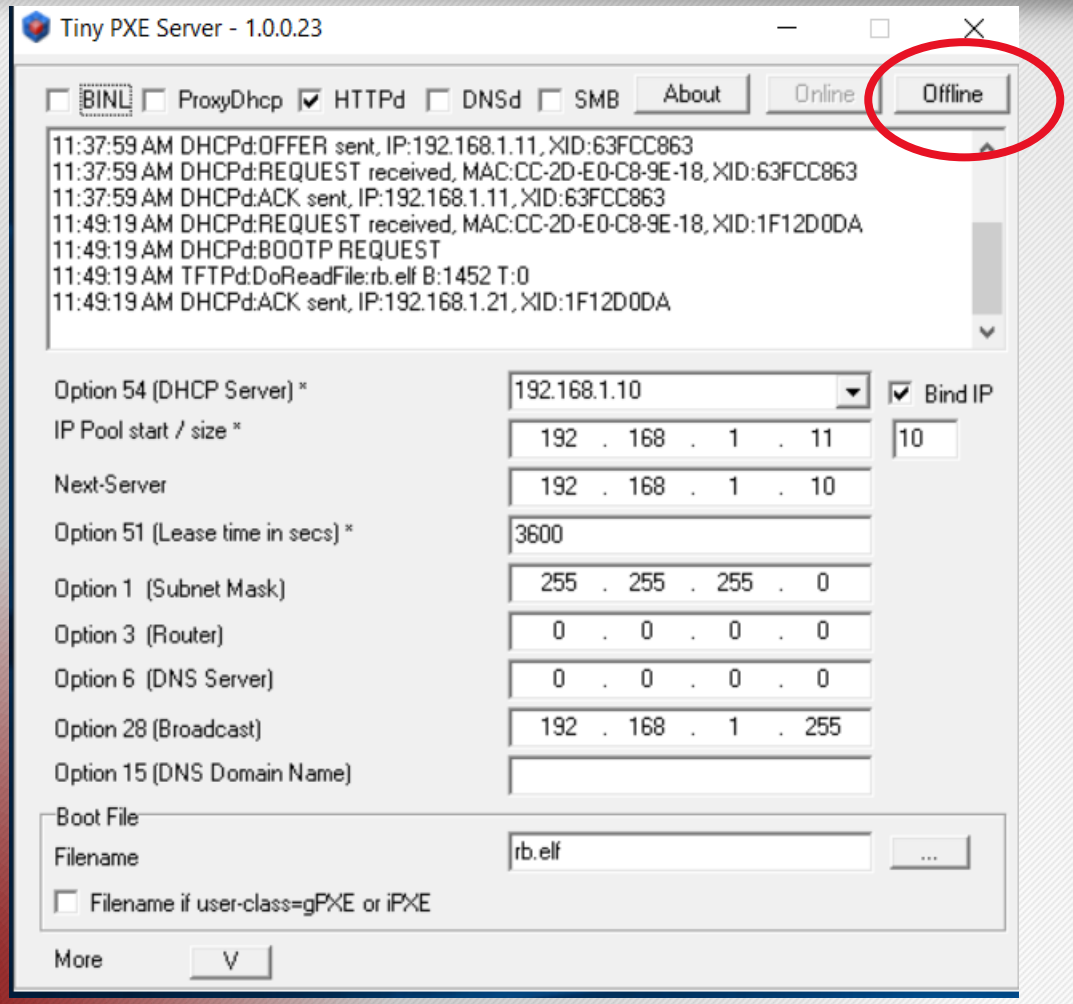


Continue holding the reset button until you see

TFTPd: DoReadFile: rb.elf

in the Tiny PXE log window.

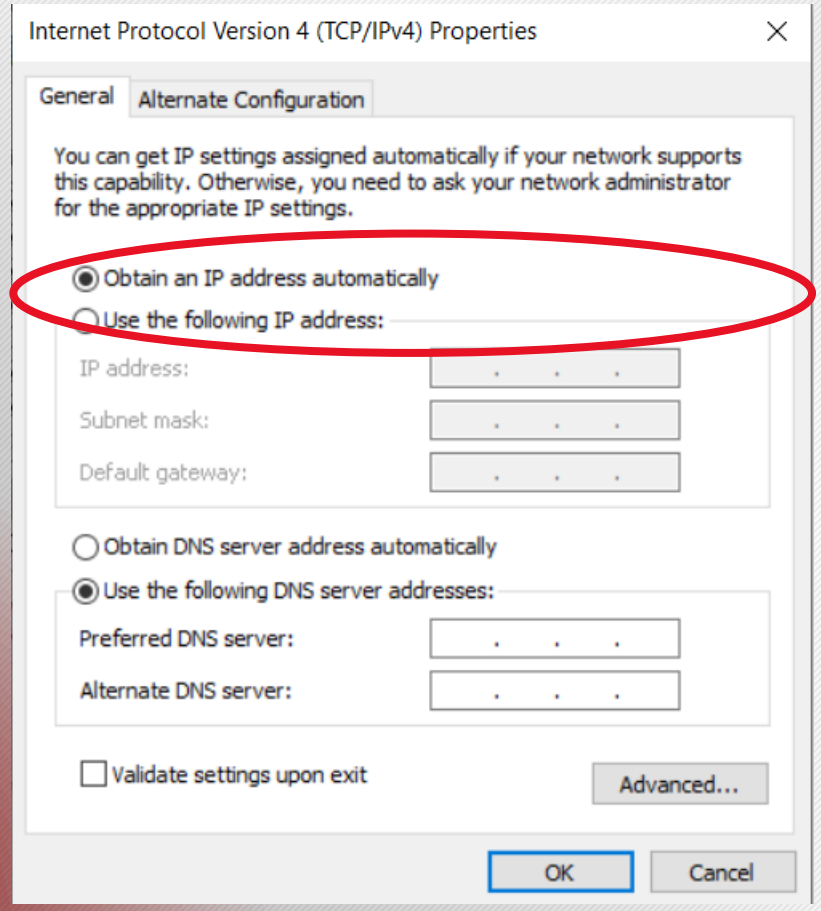
Mikrotik First Install Process - Step 7
Windows Procedure



Release the node's reset button and click the Offline button in Tiny PXE.

You are finished using Tiny PXE when the firmware image has been read by the node.

Mikrotik First Install Process - Step 8A
Windows Procedure



After booting the AREDN firmware image the node should have a default IP address of 192.168.1.1. Change your computer's Ethernet interface to DHCP mode to obtain an IP address from the node.

Mikrotik First Install Process - Step 8B
Windows Procedure

For the **hAP ac Lite**, pull the Ethernet cable from the Internet port (1) and insert it into one of the LAN ports (2,3,4). Do NOT power off the unit.

Mikrotik First Install Process - Step 8C
Windows Procedure

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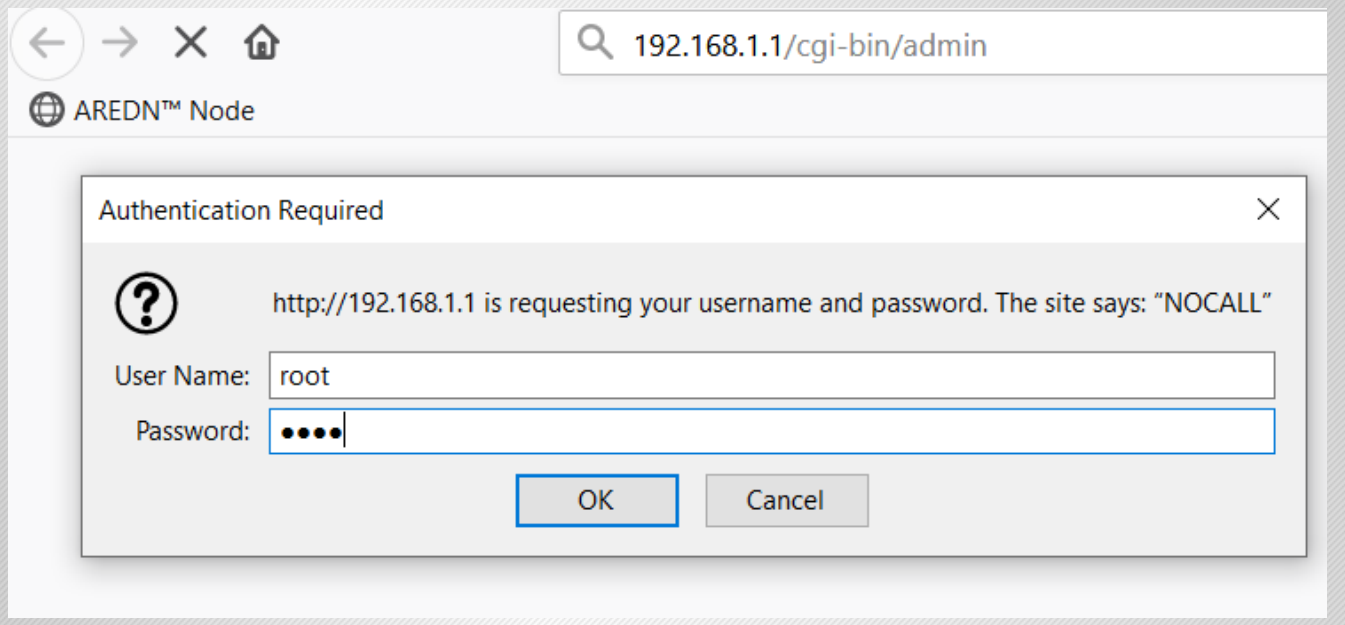
```
C:\Users\randy>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

You should be able to ping the node at 192.168.1.1. If this does not work, then something is wrong.

Don’t proceed until you can ping the node.

Mikrotik First Install Process - Step 9A
Windows Procedure

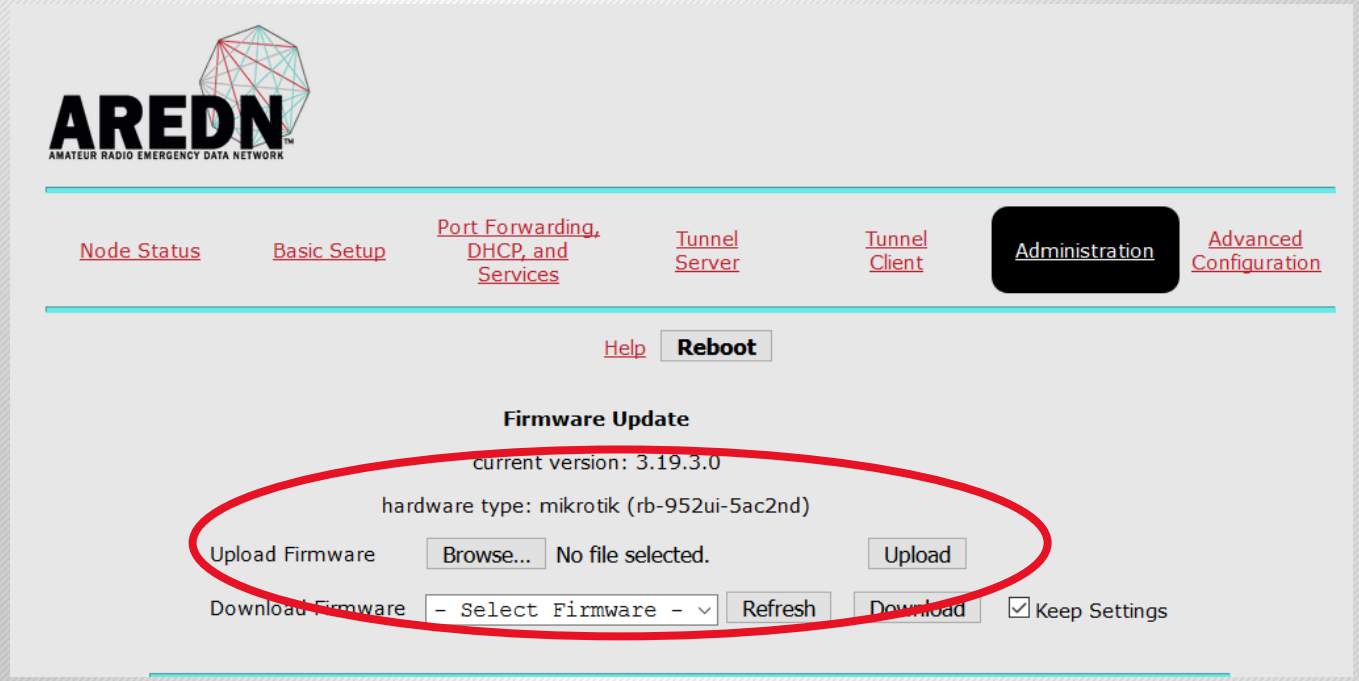
In a web browser, open the node's Administration page
http://192.168.1.1/cgi-bin/admin
user = 'root' password = 'hsmm'



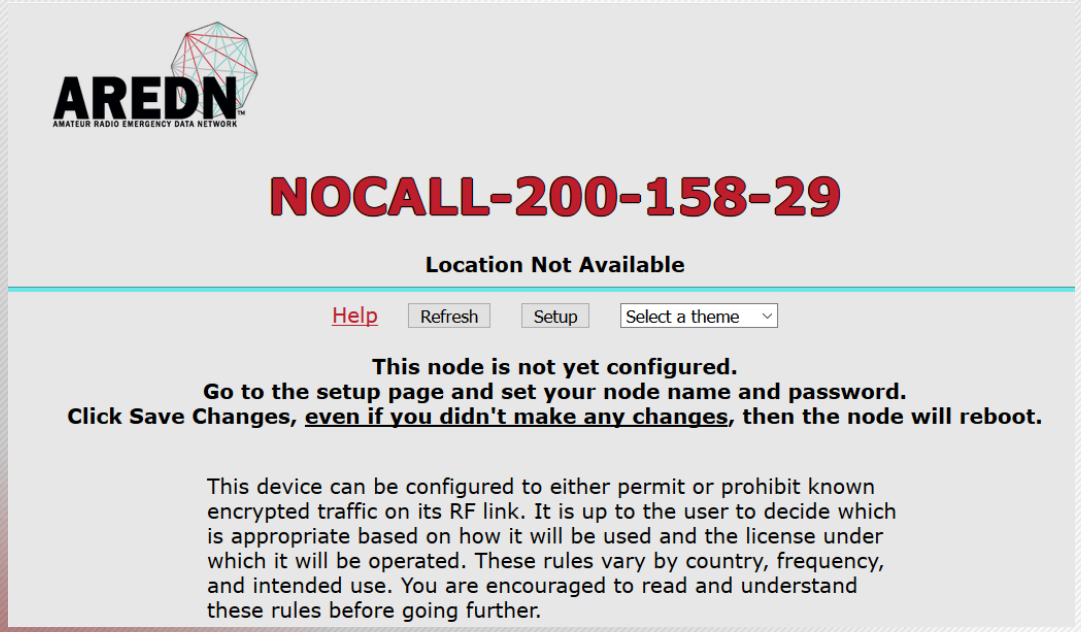
Mikrotik First Install Process - Step 9B
Windows Procedure

Go to the Setup > Administration > Firmware Update section.

Select the **sysupgrade** file you previously downloaded and click the **Upload** button.



Mikrotik First Install Process - Step 10
Windows Procedure



After the node reboots, navigate to the node's Setup page and configure the new "firstboot" node as described in the Basic Radio Setup section of the AREDN documentation.

https://arednmesh.readthedocs.io/en/latest/arednGettingStarted/basic_setup.html

At the Center of Emergency PrepAREDNess

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Thank You from the AREDN Project Team

Randy Smith, WU2S

wu2s@arednmesh.org

Semper Certus, Saepe Falsus

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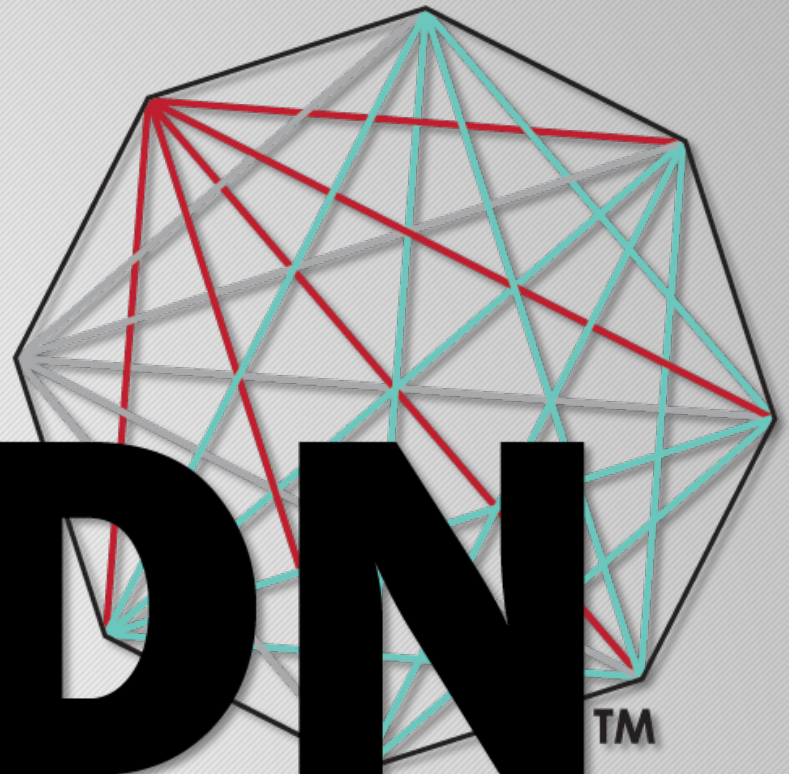

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