# Commotion Construction Kit

# Installing + Configuring
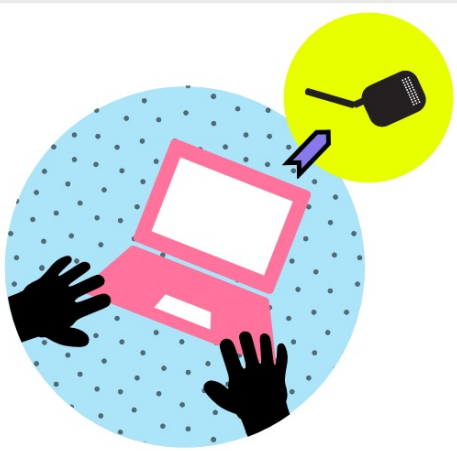
# Configure Commotion

## INTRODUCTION

This document contains instructions to configure a Commotion wireless node through the Commotion Setup Wizard and the administration interface. This is a vital part of deploying and adding nodes to a Commotion-based community wireless network, ensuring that new nodes are compatible with the network. If you have not installed Commotion on the router yet, see the document Install on a Ubiquiti Router (https://commotionwireless.net/docs/cck/install-ubiquiti-router) before using this guide. This document includes:

1. Gathering the information you need to configure your node (#Get-Ready-to-Run-Quickstart)
2. Running the Commotion Setup Wizard (#Run-Quickstart)
3. Accessing the Commotion administration interface (#Access-Administration-interface)
4. Setting basic configuration options in the Commotion administration interface (#Configure-common-options-through-the-Administrator-interface)
5. Advanced Commotion configuration settings (#Advanced-Commotion-mesh-settings)
6. A worksheet to help you record important information about your nodes and network and a "hands-on test" to become more familiar with important configuration settings (#Finish-Configuring)

Configuring Routers should take 30 minutes or less.

## MATERIALS + SUPPLIES NEEDED

1. A router with Commotion installed, plugged in to your computer's Ethernet port.

2. A copy of the worksheet (https://commotionwireless.net/sites/commotionwireless.net/files/CCK_ConfigureRouters_worksheet_0.pdf) at the end of this document, to keep track of settings.

3. (Optional) A printed or off-line copy of the node hands-on test (https://commotionwireless.net/sites/commotionwireless.net/files/CCK_ConfigureRouters_Hands-on_0.pdf) located at the end of this document.

## GET READY TO RUN COMMOTION SETUP WIZARD

If the new node will join an existing network, first gather that network's settings before you run the Commotion Setup Wizard on the router. You will need at least the mesh network name, wireless channel and the mesh encrytion password, if the mesh is encrypted. Then begin with the first section: Existing Network.

If you are starting a new network, you need to make a few decisions with your community before you run the Commotion Setup Wizard, so skip down to New Network.

### Existing Network

Talk to a network organizer to get the following information:

1. Mesh Network Name (SSID), WiFi Channel, and Mesh Encryption Password (if

used).

2. Access Point settings:

- Do the Access Points use a password?
- If so, does each node use its own password, or is there a shared password among all the nodes?
- Is there a system for generating/sharing passwords?

3. Node naming system—does the network have a way to name nodes, or can you name it anything you want?

4. Administration password—is this shared across the network, or can you set your own password? Skip to Run Commotion Setup Wizard.

### New Network

First, you need to decide basic network information. Decide with your community:

- How will you name the network and your nodes?
- How will you name your Access Points? Will they be secure or open?
- How will you create and store passwords (admin, mesh link, and maybe AP)?

Move on to Run Commotion Setup Wizard after you decide how passwords will be set, and how nodes will be named.

## RUN COMMOTION SETUP WIZARD

The Commotion Setup Wizard walks you through the basic steps to configure your router as a mesh node.

Before you start, you will need to set your computer's Ethernet connection to the **192.168.1.254** static IP, and turn off its wireless. Then browse to the URL **192.168.1.20** in your browser, if you aren't already there.

Make sure you record all the information you enter during the Commotion Setup Wizard:

- Node name
- Admininstration password
- Mesh Encryption Password
- Access Point password (if you set one).

Don't share the passwords or information with anyone, unless you trust them on the network!

1. Start Commotion Setup Wizard by clicking on the image labeled Setup Wizard:
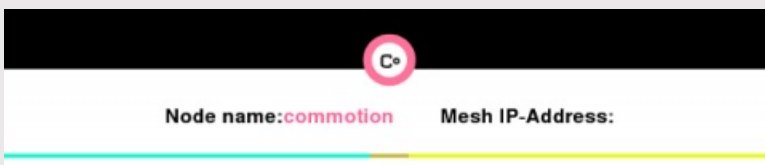
## Welcome to Commotion

This router has not yet been set up. Use the Setup Wizard for step-by-step configuration, upload a configuration file if you have one from a previously configured router, or choose Advanced for manual GUI or CLI configuration.

Setup Wizard        Advanced

Administration    About    Help    License

Note: Clicking the Advanced button will disable the Commotion Setup Wizard and allow you to configure your node manually.

2. Use the information you gathered or decided on to fill in the fields in the Commotion Setup Wizard. The Setup Wizard has four required pages and one optional page. The values you enter are saved as you navigate between pages, and are applied on the Configuration Confirmation page.

(https://commotionwireless.net/sites/commotionwireless.net/files/2-SetupWizard_Page1-fullpage.png) **Setup Wizard, page 1 - Node Settings**
Enter the Node Name and Administration Password.

(https://commotionwireless.net/sites/commotionwireless.net/files/2-SetupWizard_Page2-fullpage.png) **Setup Wizard, page 2 - Mesh Network**
Enter the Mesh Network Name and select the Channel. If your mesh network should encrypt traffic between mesh devices, check the appropriate box and enter the Mesh Encryption Password.

(https://commotionwireless.net/sites/commotionwireless.net/files/2-SetupWizard_Page3-fullpage.png) **Setup Wizard, page 3 - Wireless Network**
If desired, configure an Access Point to provide wireless network access through this node. Enter the Access Point Name, select the Channel to use, and provide a Password that people should be required to use to connect.

(https://commotionwireless.net/sites/commotionwireless.net/files/2-SetupWizard_Page4-fullpage.png) **Setup Wizard, page 4 - Configuration Complete**
You have now completed all the required steps to configure your mesh node.

- If you are done, click Finish to review and apply your settings.
- If you want to configure your node to provide an Internet Gateway, click Next.
- If you want to start over, click Reset.

 (https://commotionwireless.net/sites/commotionwireless.net/files/2-SetupWizard_Page5-fullpage.png) **Setup Wizard, page 5 - Additional Network Interfaces**

This page provides option settings to configure your node's wired interface, if desired. When you are done, click Finish

- If you want Commotion to auto-configure your wired connection, select *Automatically configure gateway on boot*
- If this node should always be given a DHCP lease from another server, select *This device should ALWAYS try and acquire a DHCP lease*
- If you would like this node to always provide DHCP leases, select *This device should ALWAYS provide DHCP leases to clients*
- If the node should not receive or provide DHCP leases, select *This device should not do anything with DHCP*

3. When you finish the Commotion Setup Wizard, the node will reset. This will take a couple minutes—be patient. When the node starts up again, it will automatically connect to other mesh nodes in the area with matching mesh link information.
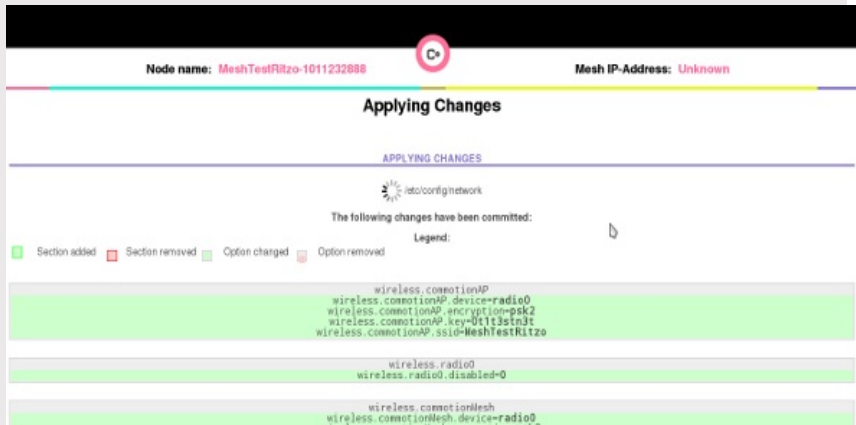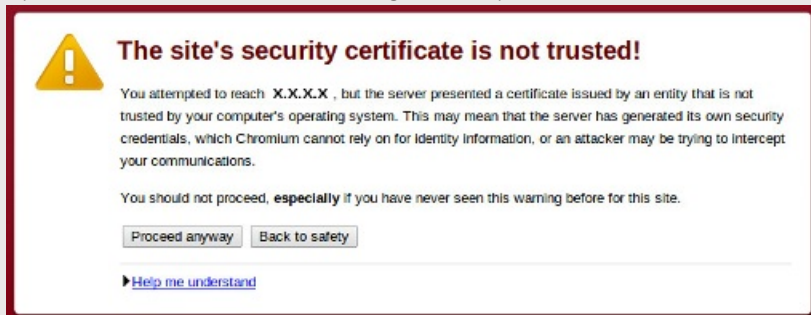


## ACCESS ADMINISTRATION INTERFACE

Now, log in to the Administrator configuration pages. After the Commotion Setup Wizard, your browser should take you to the admin page automatically. If it does not, type **thisnode/** into your browser's URL bar and press "Enter".
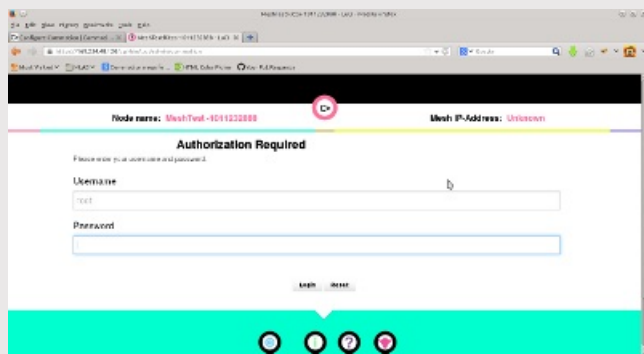
Tip: You will encounter a certificate warning here, accept it and move on.



Click on "Administration" and enter the node's admin user and password—which are

"root." You set this during the Commotion Setup Wizard.



# CONFIGURE COMMON OPTIONS THROUGH THE ADMINISTRATOR INTERFACE

The basic settings for your node were set during the Commotion Setup Wizard, but you might want to know how to change settings.

Commotion's administrative pages have two displays: Basic Config and Advanced. **Toggle between Basic and Advanced modes using the bottom button of the blue menu.** Changing the most common settings will be in Basic Config and some settings will be changed in the Advanced menus.

Below is a list of commonly changed settings and how to change them. Click below or scroll down.

- Changing the Administrator Password (#admin-password)
- Changing the Hostname (#change-hostname)
- Changing the Access Point Information (#ap-information)
- Changing the Welcome Page Information (#splash-page)
- Setting Bandwidth Limits and Quality of Service settings (#bandwidth-qos)
- How to get your node's mesh IP address (#get-mesh-ip)
- See the connections on the mesh network (#see-mesh-connections)
- Setting up a Gateway node (#set-gateway-node)
- Upgrading to new Commotion software (#upgrading-commotion)



Tip:**Note:** If at any time the interface returns a page that says "The CGI interface did not produce any response," simply wait a minute and try to reload the page. Double check that any changes you made were saved when you log-in again.
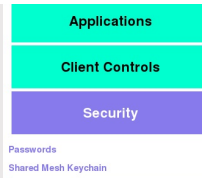


## Changing the Administrator Password

This password is for the "root" administrator on the system, and is required to change any other settings. You set this during the Setup Wizard.
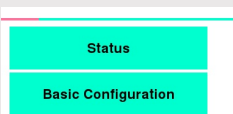
1. Navigate to **Basic Config -> Security -> Passwords**.
2. Under the "Administration Password" section, enter the new password in both "Password" and "Confirmation" fields.
3. Scroll down to the bottom of the page and click "Save & Apply".
4. Wait for the system to update. This can take up to two minutes, be patient!

ADMINISTRATION PASSWORD

This password is used to login to this node.

Confirmation

## Changing the Hostname

This changes the system identification of the node on the network, not the Access Point name.

Tip: Make sure that you don't re-use or duplicate hostnames, it will cause problems!

1. Navigate to **Basic Config** -> **Node Settings**.
2. Under the "System Properties" section, enter the new name for the node in the "Hostname" field.
3. Scroll down to the bottom of the page, click "Save & Apply".
4. Wait for the system to update.

## Changing the Access Point Information

There are three common settings for the Access Point (AP) on a Commotion node: whether the Access Point is on or off, the name of the AP (SSID), and the security (whether the AP is password-protected, and if so, the password).

Tip: Be sure to record these settings, in case you need them later.

You can change most Access Point settings in the Basic Config menus:

- Access Point Name
- Turn a password on or off
- Set or change the password for the Access Point
- Add or Delete an Access Point

Navigate to **Basic Config -> Network Settings -> Wireless Network** for Basic Menu settings.

Additionally in the Advanced menus you can:

- Enable/Disable an existing Access Point
- Also configure the settings above

Navigate to **Advanced -> Network -> WiFi** for Advanced menu settings.
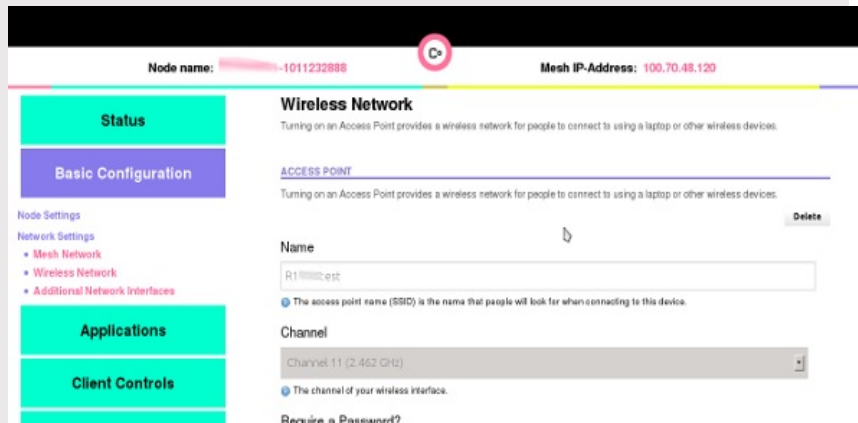


**To change the Access Point name:**

1. Under the "Access Point" section, enter a new name in the "Name" field.
2. Scroll down to the bottom of the page, click "Save & Apply".
3. Wait for the system to update. (If you are connected to the node wirelessly, you will need to re-connect to the new Name).

**To turn on a password for the AP:**

1. In the "Access Point" section, check the box under "Require a Password".
2. In the "Password" field, enter the password you want for this AP.
3. Scroll down to the bottom of the page, click "Save & Apply".
4. Wait for the system to update.

**To turn off a password for the AP:**

1. In the "Access Point" section, uncheck the box under "Require a Password"
2. Scroll down to the bottom of the page, click "Save & Apply".
3. Wait for the system to update.

**To delete an Access Point:**

1. Find the Access Point section and click the "Delete" button.

**To add a new Access Point:**

1. Scroll to the bottom of the page and click "Add"

**To turn an Access Point on or off:**

1. Navigate to Advanced -> Network -> WiFi
2. Look under "Wireless Overview" for the Network Name (SSID):
   - If the AP is enabled, it is on. To turn it off, click "Disable".
   - If the AP is currently disabled, it is off. To turn it on, click "Enable".

   **This may cause the node to become unstable. Rebooting the device after changing this function should help to prevent problems.**



## Changing the Welcome Page Information

When users connect to the Access Point, they can be directed to a Welcome Page (also called splash page or captive portal). You can turn this on or off, customize the text on this screen, and set the number of hours before a user has to re-accept the Welcome Page terms.

Tip: If there is no Gateway (ie no Internet, just a local intranet) on the network, there will be no Welcome page.

First, navigate to **Basic Config -> Client Controls -> Welcome Page**

**To change the text displayed on the Welcome page:**

1. Click "Edit Welcome Page text", at the top of the page
2. Change the HTML code in the large text field to display the information you want such as network name and contacts.
3. Scroll down to the bottom of the page, click "Submit".
4. Wait for the system to update.

You may also click "Upload" to upload an HTML file from your computer to use for the Welcome Page text.

**To change the time before a user must re-connect via the Welcome Page:**

1. Enter the number and time increment desired in the text box and select meny provided. You can enter any number and select minutes, hours, or days, for example: 5 minutes, 5 hours, 5 days.
2. Scroll down to the bottom of the page, click "Save & Apply".
3. Wait for the system to update.

TIME UNTIL WELCOME PAGE IS SHOWN AGAIN

```
10
```

```
minutes
seconds
minutes
hours
days
```

EDIT WELCOME PAGE TEXT

The welcome page can include terms of service, advertisements, or other information. Edit the welcome page text here or upload an HTML file.

Edit Welcome Page Text

Upload Welcome Page Text

**To turn the Welcome Page on or off:**

1. Turn the Welcome page on or off by selecting/deselecting the checkbox at the top of this page.
2. Scroll down to the bottom of the page, click "Save & Apply".
3. Wait for the system to update.

## Welcome Page

ON/OFF

Users can be redirected to a 'welcome page' when they first connect to this node.

FOR WHICH NETWORK CONNECTION SHOULD THIS WELCOME PAGE BE ACTIVE?

Select list of Aps and /or defined networks on this node's interfaces Auto select the first AP interface if configured.

```
commotionAP
```

## Setting Bandwidth Limits and Quality of Service settings

If you are hosting a Gateway node (sharing Internet with the rest of the network), you can limit the total amount of bandwidth allowed for the rest of the network, using Quality of Service (QoS).

Node name: ___-1011232888    Mesh IP-Address: 100.70.48.120

**Quality of Service**
With QoS you can prioritize network traffic selected by addresses, ports or services.

INTERFACES

Delete

**WAN**

Enable

Classification group

default

Calculate overhead

Half-duplex

128.1/cgi-bin/luci/;stok=b684590bd4f4fa744863abcb461c6f06/admin/network/qos    speed (kbit/s)

Status
System
Services
Network

• Interfaces
• Wifi
• DHCP and DNS
• Hostnames
• Static Routes
• Firewall
• Diagnostics
• QoS

1. Navigate to **Advanced ->Network -> QoS**.
2. Select the "Enable" and "Calculate Overhead" checkboxes.
3. In the "Download Speed" field, enter the total download bandwidth to deliver to the mesh (in kilobits per second—for approximately 5 Mbps, enter 5000).
4. In the "Upload Speed" field, enter the total upload bandwidth to deliver to the mesh (in kilobits per second—for approximately 1 Mbps, enter 1000).
5. Scroll down to the bottom of the page, click "Save & Apply".
6. Wait for the system to update.

How to get your node's mesh IP address

It is important to note down the mesh IP address for your node.

1. Navigate to the **Status** page.
2. Your node's mesh IP address is displayed in the top menu bar on the right.

See the connections on the mesh network

You can see if the node has successfully connected to other mesh nodes in two ways.

When not logged in, hover your mouse on Overview above the Commotion logo on the front page, then click **Nearby Mesh Devices**.



- Gateway Node,  - Basic Node

5.79.147.160
1.356
5.133.13.23

1.814
1.692

5.75.125.46

1.284

**5.79.147.92**

Zoom $+$ $-$ [ 2 ] | Max-Hops $+$ $-$ [ 3 ] | Auto-Spacer ☑ | Host
Names ☐ | Save Settings | Reset
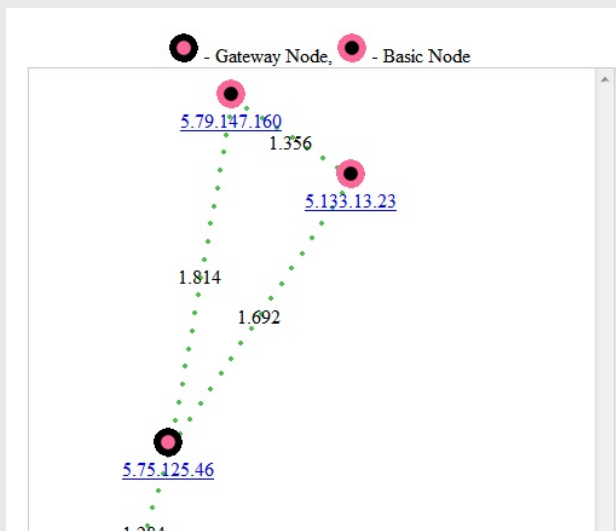
**or**

Navigate to the **Status** page and click on **Nearby Mesh Devices**.

## Setting up a Gateway node

If you would like to share bandwidth with the network, you can make your node a
Gateway. You may want to finish other setup before completing these steps, such as
Quality of Service, above.

1. Plug the LAN port on the Power over Ethernet adapter into your
   Internet-connected router or modem.
2. Navigate to **Advanced -> System -> Reboot** to reboot the node.
3. Click "Perform Reboot" and wait for the node to restart.
4. It will automatically configure itself as a Gateway and provide
   bandwidth to the network when it is back online.
5. Navigate to the Status page. If this node is providing a Gateway, it will
   be indicated here in the top menu bar. Additional details can be found
   in **Advanced -> Status -> OLSR**

## Upgrading to new Commotion software

Occasionally there are new releases of the Commotion Wireless software, available
online at **commotionwireless.net**. Please download the "sysupgrade" version and
follow these directions.



Tip: There is important information about verifying what you download at
**https://commotionwireless.net/download/verify-signatures**.

Be sure to record your node and network settings so that you can re-enter them when you run
Quickstart with the next version of the software.

1. Navigate to **Advanced -> System -> Backup / Flash Firmware**.
2. Under the "Flash New Firmware Image" section, uncheck the "Keep
   Settings" option.
3. To upgrade to the new software, click in the rectangular field below
   that, and select the file you have downloaded. Click "Flash Image...".
4. On the page that follows, wait for the file to upload, then click
   "Proceed".
5. Wait for the system to update.
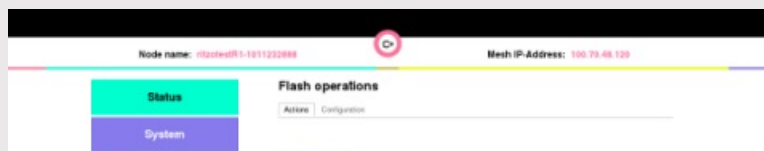
## ADVANCED COMMOTION MESH SETTINGS

You can change the configuration of a router on the mesh network that you set during the Quickstart process. You might do this either to separate from the mesh network or to change the identity of the network.

1. Navigate to **Basic Config -> Network Settings -> Mesh Network**
2. Select the Wi-Fi channel your network will use: either "2GHz Channel" or "5GHz Channel" depending on the capabilities of your wireless node. This channel must be the same across the entire network.
3. In the "Mesh SSID" field, enter the name of your network. This name must be the same for every node on the network.

## FINISHING UP

When you are done configuring, disconnect the Ethernet cable from the computer. If you wish to host a Gateway (share Internet with the mesh network), plug it into your Gateway router/modem. If not, save it for later configuration and troubleshooting.

For more detailed information on node, mesh, and AP security, see the module Secure the Network (Hardware and Software). For problems with a node or the network, we're developing a new module *Troubleshoot for Node Hosts* which will be available soon.

## CHECK YOUR UNDERSTANDING

This is a short hands-on test you can use to explore any Commotion node's administrator interface. Completing this test is not required to set up a node on a network, but it can help you understand how to find important information that network administrators need to keep the network functioning properly. If you are configuring several nodes with other people, everyone can explore these details if they run through this test on their node, and fill out the answers.



### Wireless Installation Hands-on Test

Find all of the information about your node!

1. What is the name of the node I'm connected to?

2. What is the mesh IP address of the node I'm connected to?

3. Who are this node's neighbors? List their mesh IP addresses, and hostnames if you can find those too.

4. Which neighbor has the best connection to this node?

5. What is the maximum number of hops (nodes) between two nodes on the network?

6. Is this mesh network connected to the Internet? If so, which nodes(s) are connected to

7. What is the MAC address of the wireless network card of this node?

# RECORD IMPORTANT INFORMATION

As you check and change these settings, be sure to securely record the information. You can use this worksheet if it is helpful.

**Wireless Installation Worksheet**          Date:

*As you complete an installation, record the important information.*

**What is the node's hostname?** (the name of the router)

**What is the node's location – address, place name, and specific location at the site?**

**Who is the contact person for this node? What is their contact info if you need to gain access?**

**What model of node is it?** (PicoStation, NanoStation M2 /M5, TP-Link, etc)

**What version of software is on the router?**

**What is the SSID / access point name (and password if protected)?**
**Is is visible to the public?** YES or NO

**What is this node's admin password?**

**What is this node's MAC address** (on the underside of the router, like xx:xx:xx:xx:xx:xx)?

**What is this node's mesh IP address** (5.xx.xx.xx)?

**Is this node a gateway** (is it plugged directly into an Internet provider) YES // NO

**Any technical notes about this router?** (Special configurations such as channel; what does it plug into and how, does it mesh with any other nodes and if so how and which nodes; etc)

**Does this site need further work? If so, what is complete and what should happen next?**

# DEFINITIONS

AP (Access Point):
This is a device that allows wireless clients, such as laptops or smart phones, to connect to a network using Wi-Fi.

BSSID (Basic Service Set Identifier):
The address used to identify a specific mesh network. It is used by the wireless mesh link device.

Gateway:

A connection to another network, usually the Internet. One or more nodes on a mesh network can be Gateways.

Hostname:
The name of a node. A nickname that corresponds to the address of a device connected to a network. It can be the same, similar to, or different than the SSID of the Access Point.

IP Address:
A numerical label assigned to each device (e.g., computer, printer, router) participating in a network that uses the Internet Protocol for communication.

MAC Address:
A unique hardware identifier assigned to network interfaces.

Mesh Network:
A type of network where each node in the network may act as an independent router, and can connect to many nodes at once.

Node:
Any router connected to a mesh network.

OLSR (Optimized Link State Routing Protocol):
an IP routing protocol optimized for mobile ad hoc networks.

Root:
A user account used for system administration.

Splash Page or Captive Portal:
A web page that appears when users first attempt to connect to the network via an Access Point. It usually requires accepting terms of service to reach the Internet.

SSID (Service Set Identifier):
A name that uniquely identifies a wireless local area network. Most often it is the name of an Access Point. It can be a human-readable name, and can be up to 32 characters long.

## RELATED INFORMATION

Modules to complete to prepare for this one

- Install on a Ubiquiti RouterInstall on a Ubiquiti Router (https://commotionwireless.net/docs/cck/installing-configuring/install-ubiquiti-router)
- Install and recover with TFTP (https://commotionwireless.net/docs/cck/install-and-recover-tftp)

Other modules referenced in this one

- Secure the Network (Hardware and Software)
- Troubleshoot for Node Hosts (in development, coming soon.)

Possible modules to follow this one

Possible modules to follow this one

- Troubleshoot for Node Hosts (in development, coming soon.)

Related modules in other units

- Networking: Learn Networking Basics

**Files:**

CCK_ConfigureRouters_Hands-on.pdf
(https://commotionwireless.net/sites/commotionwireless.net/files/CCK_ConfigureRouters_Hands-on_0.pdf)

CCK_ConfigureRouters_worksheet.pdf
(https://commotionwireless.net/sites/commotionwireless.net/files/CCK_ConfigureRouters_worksheet_0.pdf)

(https://commotionwireless.net/fr/docs/cck/installing-configuring/configure-commotion)