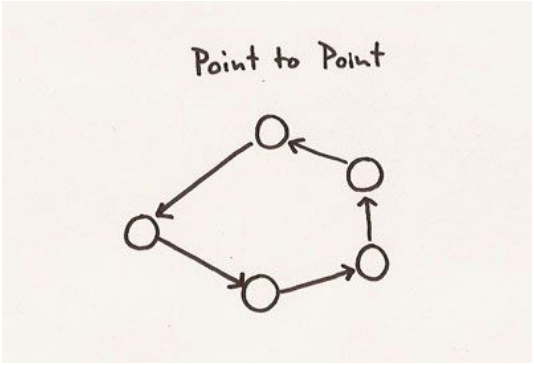
Documentation Xbee.

Main differences between Xbee Serie 1 - Xbee Serie 2

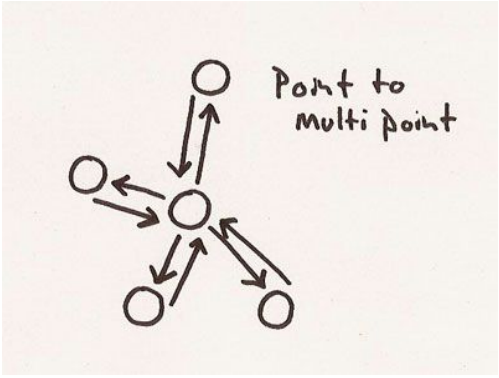
	Xbee Series 1	Xbee Series 2
Indoor range	30m	40m
Outdoor Range	100m	120m
Transmit Power Ouput	1mW	2mW
Nework Topologies	Point to Point*, Star**	Point to Point*, Star**, Mesh

The main advantage of Xbee Series 2 (Zigbee), it's the possibility to make easily a Mesh Network.

(*) Point to Point Network

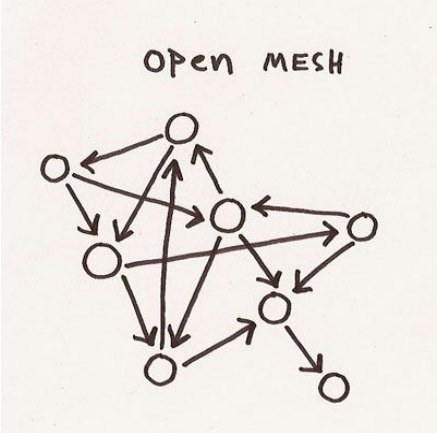


(**) Star or Point to multi point



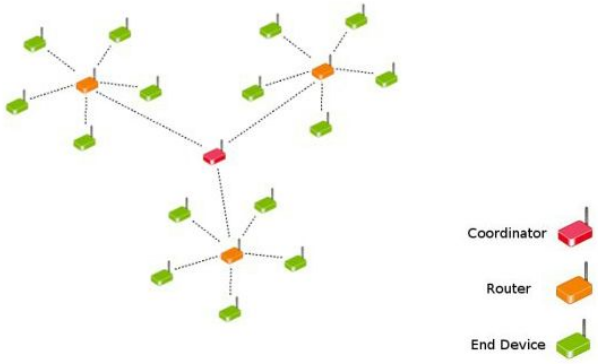
Mesh network

*A **mesh network** is a network topology in which each node relays data for the network. All nodes cooperate in the distribution of data in the network. Every node in a mesh network is called a mesh node. (wikipedia)*



Zigbee network

For each Zigbee network, you need to have a **coordinator** *(no coordinator, no network !).*
The **routers** forward the information while the **End Device** not.
All Zigbee network have a unique pan ID.
Below a little diagram of a zigbee network.



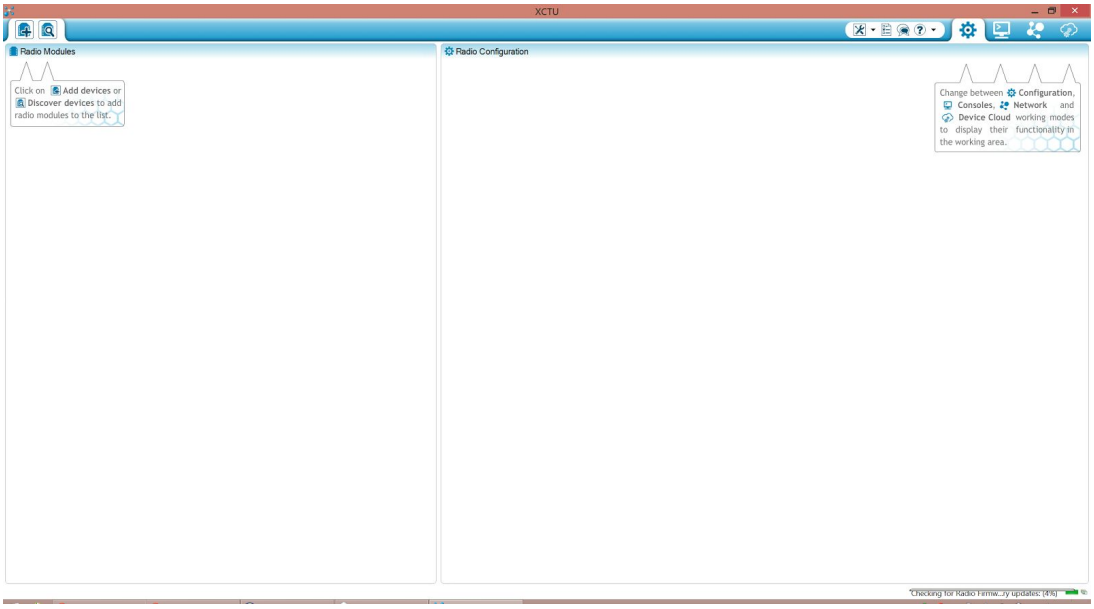
Configuration Requirement

The Zigbee configuration is needed before use it and it cannot be done via code (unlike the serie 1 which can be configure in AT commands). For Xbee 2 you have to download a software called X-CTU (http://www.digi.com/support/kbase/kbaseresultdetl?id=2125).

The second step is to connect the xbee directly at the computer. For this, you have to use a xbee explorer (you can find one here : https://www.sparkfun.com/products/11812).

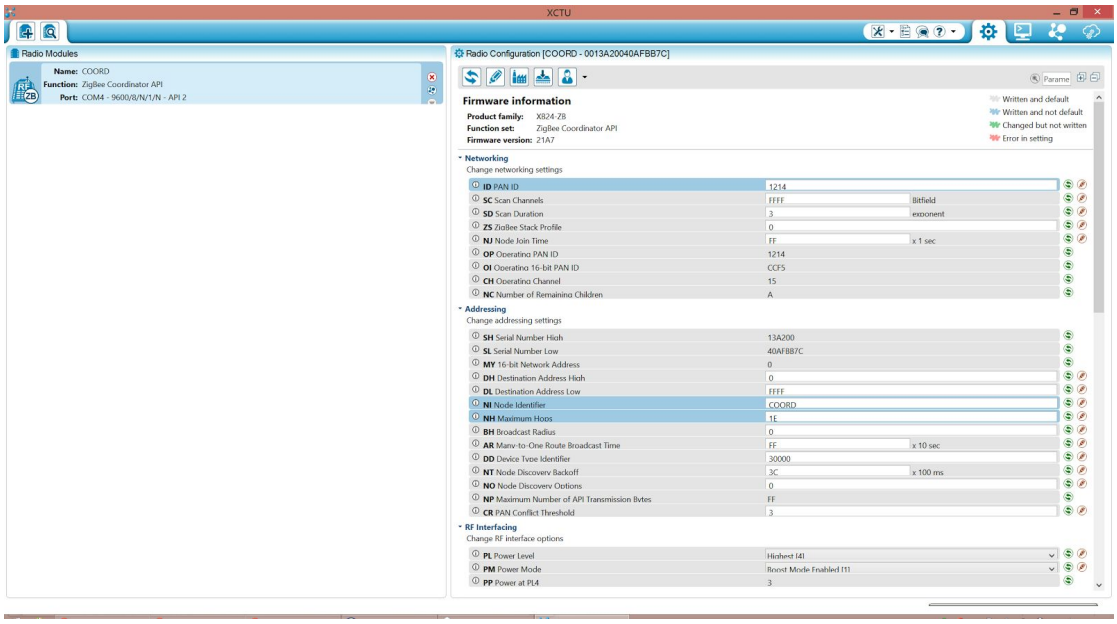
Configuration Software

- Launch X-CTU



- Choose the right COM port and the configuration which fit well with the port (Baud Rate, DataBits,...).

- Click on “Finished”. *(The Xbee Connected is appeared on the left side)*
  When you click on it, you can check all informations store in the xbee 2.



The first thing to know, it's the future xbee role. You have 3 possibilities:

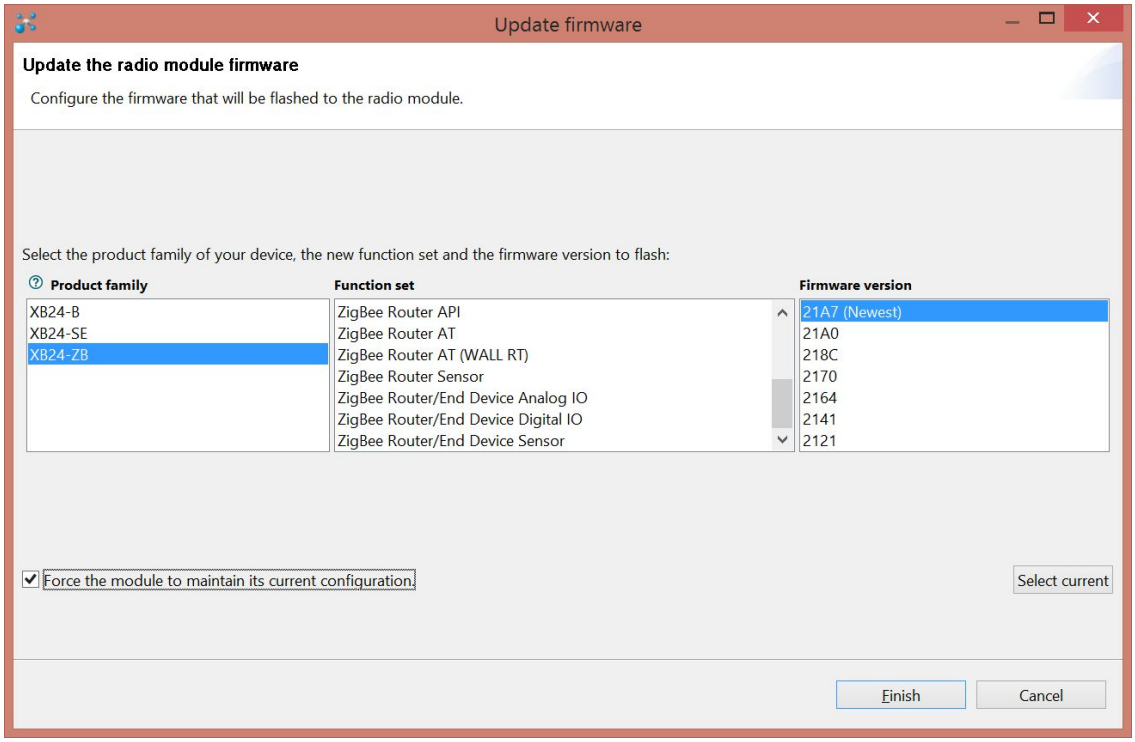
1. Coordinator
2. Router
3. End Device

For each possibility, there are two options: AT or API.

What the differences between AT (transparent mode) and the API (Application Programming Interface) mode?

The API allows the programmer the ability to:

- Change parameters without entering command mode
- Receive packet delivery confirmation on every transmitted packet
- Of course, some libraries are available in API mode.



After the updating of the firmware's xbee. You can become the zigbee configuration.

I'm going to presente you only the most important elements in the configuration.

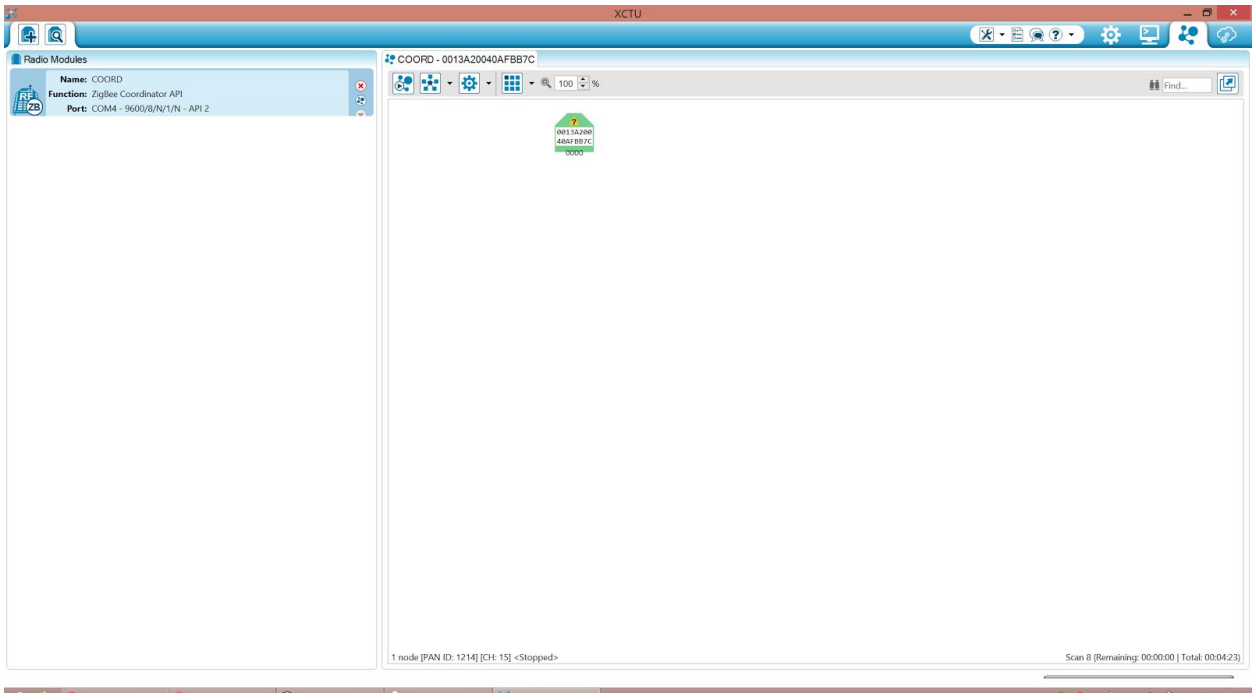
- **Pan ID**: It's the unique ID of the Zigbee network.
- **Node identifier**: It's the xbee name (sharing on the network).
- **BaudRate** : Set the baudrate value.
- **API Enable**: you can change the API mode*

(*) There are two level of the API (1 and 2). The only difference between option 1 and 2 is the requirement to use escape characters. You have to be vigilant because some library demand to be in a specific mode. (eg: Xbee arduino require API mode 2).

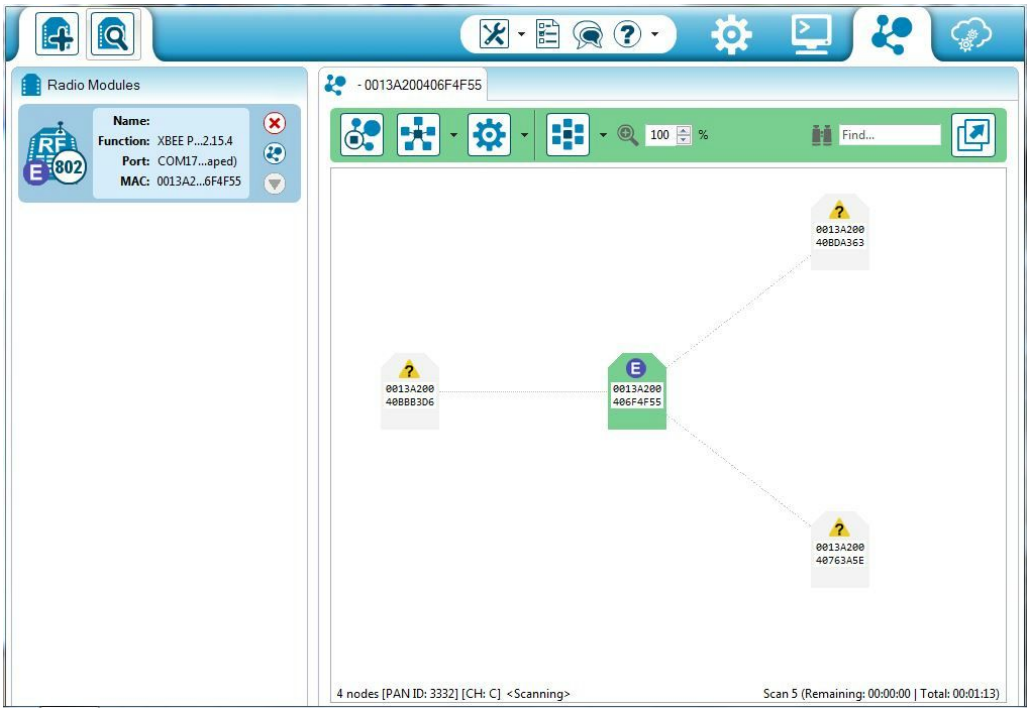
Note: You can read on the internet, that API mode 1 and 2 are compatible, but we have meet some problem when we wasn't in the same mode.

Checking the configuration

When you have configured all your xbee for making a network, you can have an overview of the network.



Press the ‘Scan’ button and all connected devices will be shown.



For testing you network, you can also use the x-ctu console which allow you to show all packets emit and received by the xbee and send packet directly to another xbee.