Technical Report - Connecting the Parrot Bebop Drone to a Router (Multiple Bebop's)

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Introduction:

The Parrot Bebop Drone is one of the UAV's used in the TECHLAV test bed but is not compatible with ROS or any other network configurations besides its default configuration. In this technical report, the latter is addressed and in the following sections the steps to reconfigure the Bebop's network settings are presented. This procedure is necessary in order to connect multiple Bebop's to the same network accesses point. Each bebop has a default IP that will conflict with other Bebop's on the same network, thus the goal of these procedures is to allow the Bebop's IP to be reassigned and then connected to the desired network.

Procedure:

The out of the box firmware blocks certain networking capabilities that are standard in most Linux distributions. The author believes this is due to Parrot's SkyController, and the fact that these tools would allow the user to replicate the functionallity of the SkyController without buying it. To fix this do the following:

1. Add the files from github to the drone using the nc terminal command in the same path i.e. lib or sbin:
   /lib/libiw.so.29
   /lib/libiw.so
   /sbin/ifrename
   /sbin/iwconfig
   /sbin/iwevent
   /sbin/iwgetid
   /sbin/iwlist
   /sbin/iwpriv
   /sbin/iwspy

2. Use the command:

   chmod 777 <filename>

   to make all the files executable on the drone

A similar problem occurred for Parrots older drone, ARDrone 2.0, and we will use the work around ROS package in the following steps:

3. Download the ARdrone-wpa2 package

   sudo apt-get install ros-indigo-ardrone-wpa2

4. cd to the ardrone-wpa2 package and copy the following files to the drones /bin folder and repeat step 5 to make each file executable:

   wpa_cli
   wpa_passphase
   wpa_supplicant

5. In the ARDrone-wpa2 folder go in to scripts and open the connect script in an editor of your liking (nano, geddit, etc.)

   -change any reference to ath0 to eth0

   -change the default ip from 192.168.42.1 to 192.168.1.xxx (this is on the DRONEIP= line), i.e. any other unique ip address that is available on the network router

6. Follow the readme file in the ARDrone-wpa2 folder to switch the bebop to a secured network.

Conclusion:

Applying these procedures to each Bebop will allow each to be assigned a unique IP address and connected to a specified access point. Not only does this allow for the use of a powerful network router, i.e. Linksys but it also allows multiple drones to share the same network without conflicting IP addresses.