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Quick Start Guide for x86 FT

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Table of Contents

1 INTRODUCTION.....4

2 PREREQUISITES.....5

3 INSTALLATION.....6

4 OPERATION.....7

5 WINDOWS LOOK AND FEEL.....18

6 DIAGNOSTICS.....19

7 KNOWN LIMITATION AND ISSUES.....20

1 Introduction

1.1 Purpose

This document provides FOUO “quick start” info for the x86 Flytrap (FT) product, including installation and usage instructions. For more detailed info, see the x86 FT User’s Manual.

1.2 Applicable Documents

- x86 FT User’s Manual

2 Prerequisites

The x86 FT product requires the following (for all use cases of section 4):

- x86 laptop with 1 PCMCIA Card slot and 1 Express Card slot
- 1 Ubiquiti SRC PCMCIA Card with detachable antenna
- 1 Ubiquiti SR71X Express Card with detachable antenna
- Fedora Core 14 Installation DVD
- x86 FT Installation CD

Note that the x86 FT software has been installed and tested on a hard drive/caddy that easily inserts into the removable hard drive slot of a Panasonic Toughbook CF-74, which is one of the laptops in the CB Test Kit.

3 Installation

If you are using the x86 FT hard drive/caddy for the Panasonic Toughbook CF-74 (that is part of the CB Test Kit), no installation is required (root password is squid123! by default but should be changed and documented by the operator). Otherwise, to install the x86 FT software on an x86 laptop meeting the requirements of section 2:

1. Insert the “Fedora Core 14 Installation DVD” and power-on the laptop
2. Follow the Fedora Core 14 installation instructions, selecting the “**Software Development**” option as the Software Set to install initially.
3. Log on to the computer as root (you will have set the root password in the prior Fedora Core 14 installation step).
4. Insert the “x86 FT Installation CD”.
5. Open a terminal (Applications -> System Tools -> Terminal), change to root, and navigate to the x86_ft directory on the CD:

```
su      (you will be prompted for the root password)
cd /media/x86_ft
```

6. At the terminal enter:

```
./install.sh
```

and follow the instructions. You will need to enter “yes” at the java package installation step.

NOTE: it can take a few minutes before any output shows up.

NOTE: If you want to install the debug version (in addition to the release version) of the x86 FT software, run “./install.sh -d” instead.

7. Reboot the laptop and login as ftuser (default password is squid123!).
8. If desired, install the Windows Look and Feel according to the instructions in section 5.

4 Operation

This section discusses operation of the x86 FT software with use case examples.

4.1 Use Case 1: Wireless Repeater (Bridge)

This is the primary use case. The x86 FT acts as a repeater to an existing wireless network. In this case, the x86 FT operates in “bridge” mode (see 4.4 for a discussion of bridge vs. router operation). Operation is as follows:

1. Login to the laptop as “ftuser”. Default password for ftuser is “squid123!” (change the password at your discretion).
2. Remove any PCMCIA and/or Express Cards
3. Insert the Ubiquiti SR71X Express Card
4. Insert the Ubiquiti SRC PCMCIA Card
5. Open a terminal (Applications -> System Tools -> Terminal), navigate to the ~ftuser/bin directory:

```
cd ~ftuser/bin
```

6. Ensure that the proper interface is configured in the ~ftuser/bin/kismet.conf file. To do so, run:

```
sudo lshw -c network
```

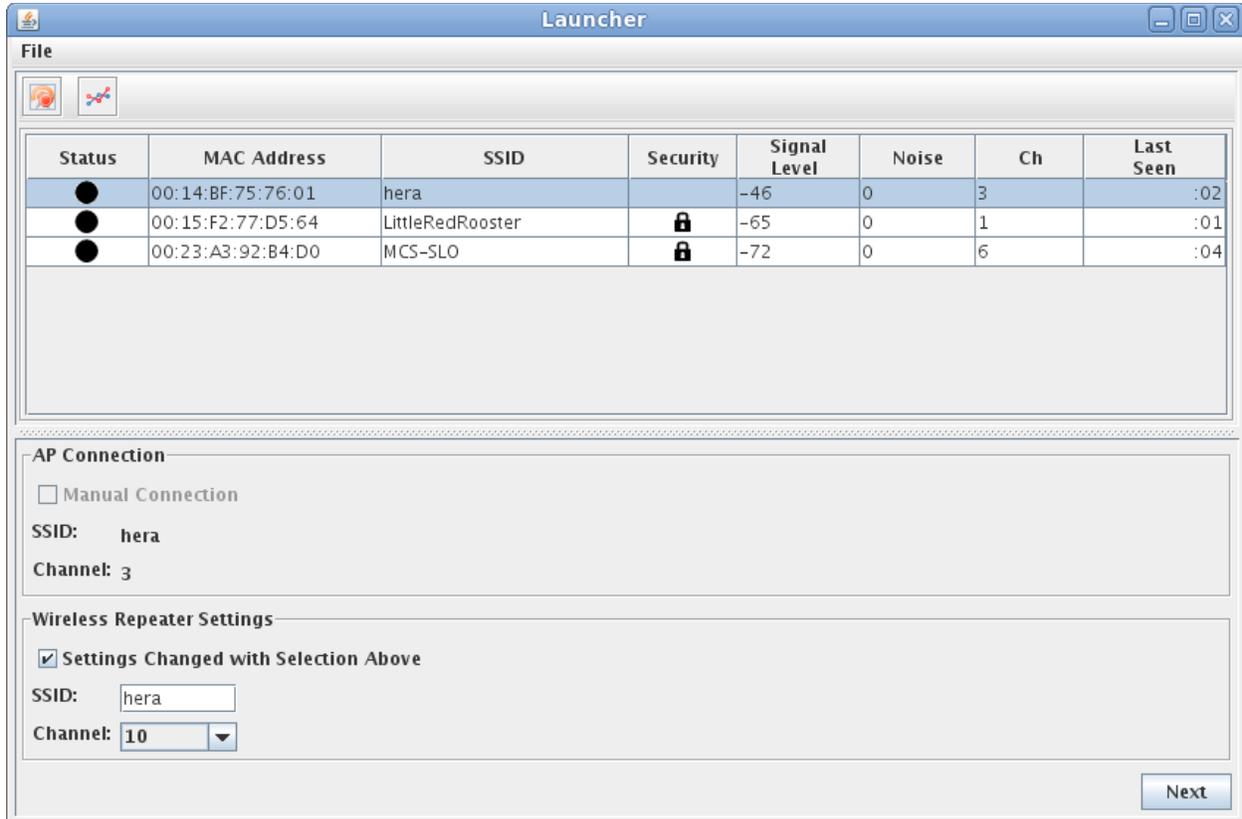
Under the “product: AR928X Wireless Network Adapter” entry locate the “logical name” value (which should be wlanX, where X is an integer number). Edit the ~ftuser/bin/kismet.conf file (using, for example, “gedit ~ftuser/bin/kismet.conf”) and set the “ncsource” parameter to the “logical name” value; for example, if the logical name was found to be wlan2, then edit the “ncsource” parameter as “ncsource=wlan2”.

7. Run the ftlauncher.sh script:

```
./ftlauncher.sh
```

Quick Start Guide for x86 FT

- This will display the "Launcher" GUI (shown below) with a list of wireless networks in the area (this list can take up to 10 seconds to populate). Select the wireless network you want to repeat (in this example, the wireless network with SSID "hera" has been selected). Click the "Next" button.



Quick Start Guide for x86 FT

- This will display the “Network Settings” GUI (shown below). For “Mode”, select “Bridge”. **Carefully** enter the beacon address, which can be an IP address (e.g. 1.2.3.4) or a domain name (e.g. my.server.com). In this example, the address “127.0.0.1” has been entered. Click the “Start” button.

Network Settings

Mode

Bridge

Router

Beacon

Address:

Repeater Interface

SSID: hera

Channel: 10

Set Via DHCP

IP Address:

Netmask:

DHCP Range: to

Backhaul Interface

SSID: hera

Channel: 3

Backhaul Interface:

Set Via DHCP

IP Address:

Netmask:

Nameservers:

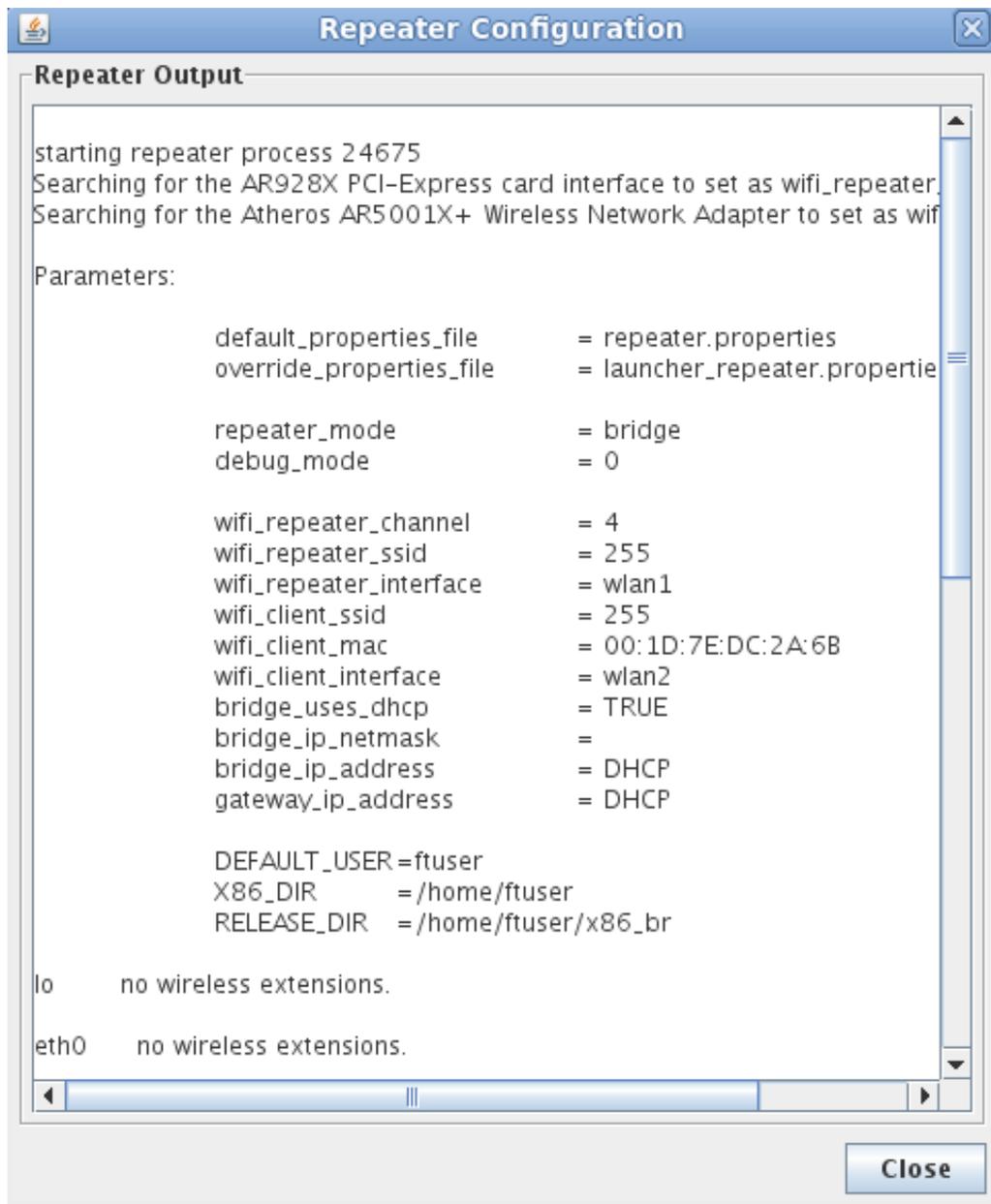
Gateway

Address:

Save Start Stop

Quick Start Guide for x86 FT

10. This will display the “Repeater Configuration” GUI (shown below). Status and error messages will display in this GUI. If an error occurs, diagnose according to instructions in section 6.



To stop the x86 FT, click the “Stop” button on the “Network Settings” GUI of step 9. Note: alternatively, you can stop by opening a terminal (Applications -> System Tools -> Terminal), navigating to the `~ftuser/bin` directory (`cd ~ftuser/bin`), and running `“sudo ./stop-repeater.sh && sudo ./repeater.sh -d”`).

4.2 Use Case 2: Wireless Repeater (Router)

The x86 FT acts as a repeater to an existing wireless network, but works as a router instead of a bridge (see 4.4 for a brief discussion of bridge vs. router operation). Operation is as follows:

1. Login to the laptop as “ftuser”. Default password for ftuser is “squid123!” (change the password at your discretion).
2. Remove any PCMCIA and/or Express Cards
3. Insert the Ubiquiti SR71X Express Card
4. Insert the Ubiquiti SRC PCMCIA Card
5. Open a terminal (Applications -> System Tools -> Terminal), navigate to the ~ftuser/bin directory:

```
cd ~ftuser/bin
```

6. Ensure that the proper interface is configured in the ~ftuser/bin/kismet.conf file. To do so, run:

```
sudo lshw -c network
```

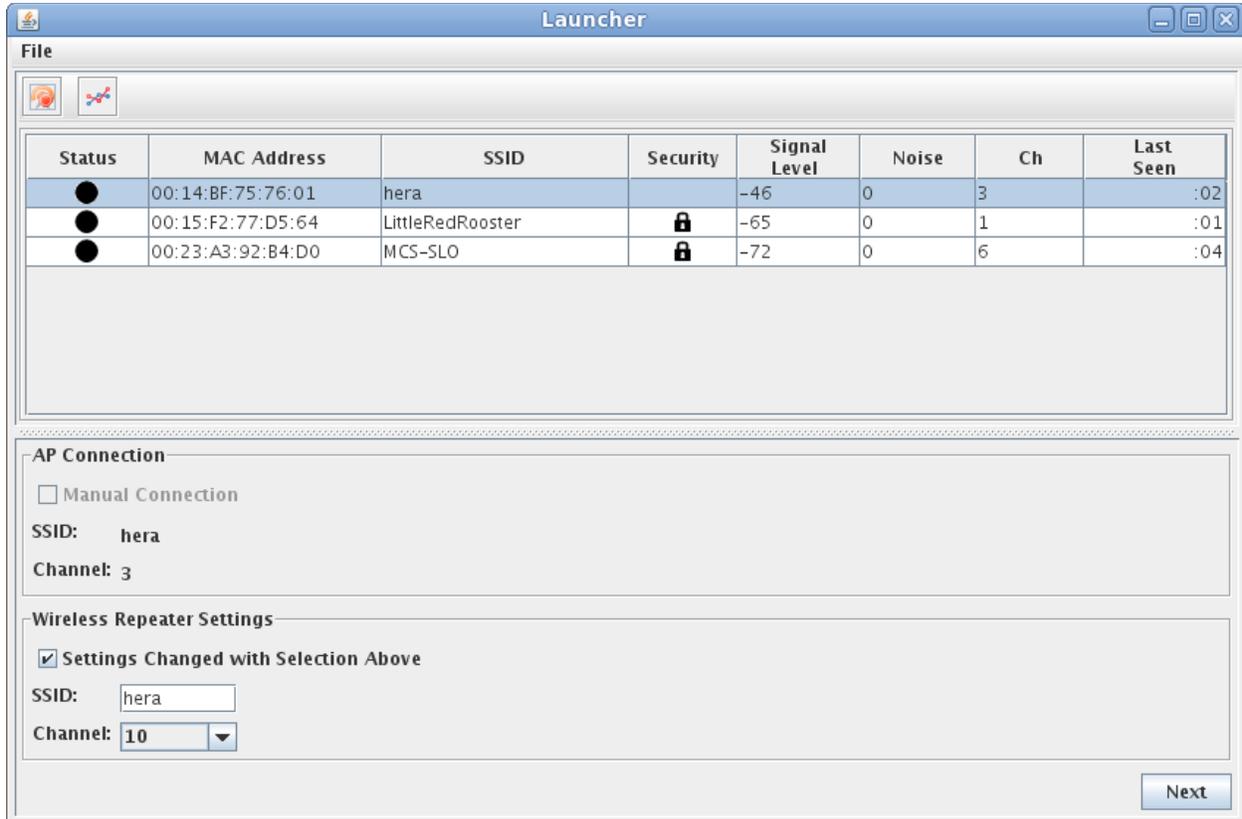
Under the “product: AR928X Wireless Network Adapter” entry locate the “logical name” value (which should be wlanX, where X is an integer number). Edit the ~ftuser/bin/kismet.conf file (using, for example, “gedit ~ftuser/bin/kismet.conf”) and set the “ncsource” parameter to the “logical name” value; for example, if the logical name was found to be wlan2, then edit the “ncsource” parameter as “ncsource=wlan2”.

7. Run the ftlauncher.sh script:

```
./ftlauncher.sh
```

Quick Start Guide for x86 FT

- This will display the "Launcher" GUI (shown below) with a list of wireless networks in the area (this list can take up to 10 seconds to populate). Select the wireless network you want to repeat (in this example, the wireless network with SSID "hera" has been selected). Click the "Next" button.



Quick Start Guide for x86 FT

- This will display the “Network Settings” GUI (shown below). For “Mode”, select “Router”. **Carefully** enter the beacon address, which can be an IP address (e.g. 1.2.3.4) or a domain name (e.g. my.server.com). In this example, the address “127.0.0.1” has been entered. Under “Repeater Interface”, enter “IP Address” (shown here as 10.127.254.1), “Netmask” (shown here as 255.255.255.0), and “DHCP Range” (shown here as 10.127.254.2 to 10.127.254.254). In most cases, these default values should be acceptable. Click the “Start” button.

Network Settings

Mode

Bridge

Router

Beacon

Address: 127.0.0.1

Repeater Interface

SSID: hera

Channel: 10

Set Via DHCP

IP Address: 10.127.254.1

Netmask: 255.255.255.0

DHCP Range: 10.127.254.2 to 10.127.254.254

Backhaul Interface

SSID: hera

Channel: 3

Backhaul Interface: auto

Set Via DHCP

IP Address:

Netmask: 255.255.255.0

Nameservers:

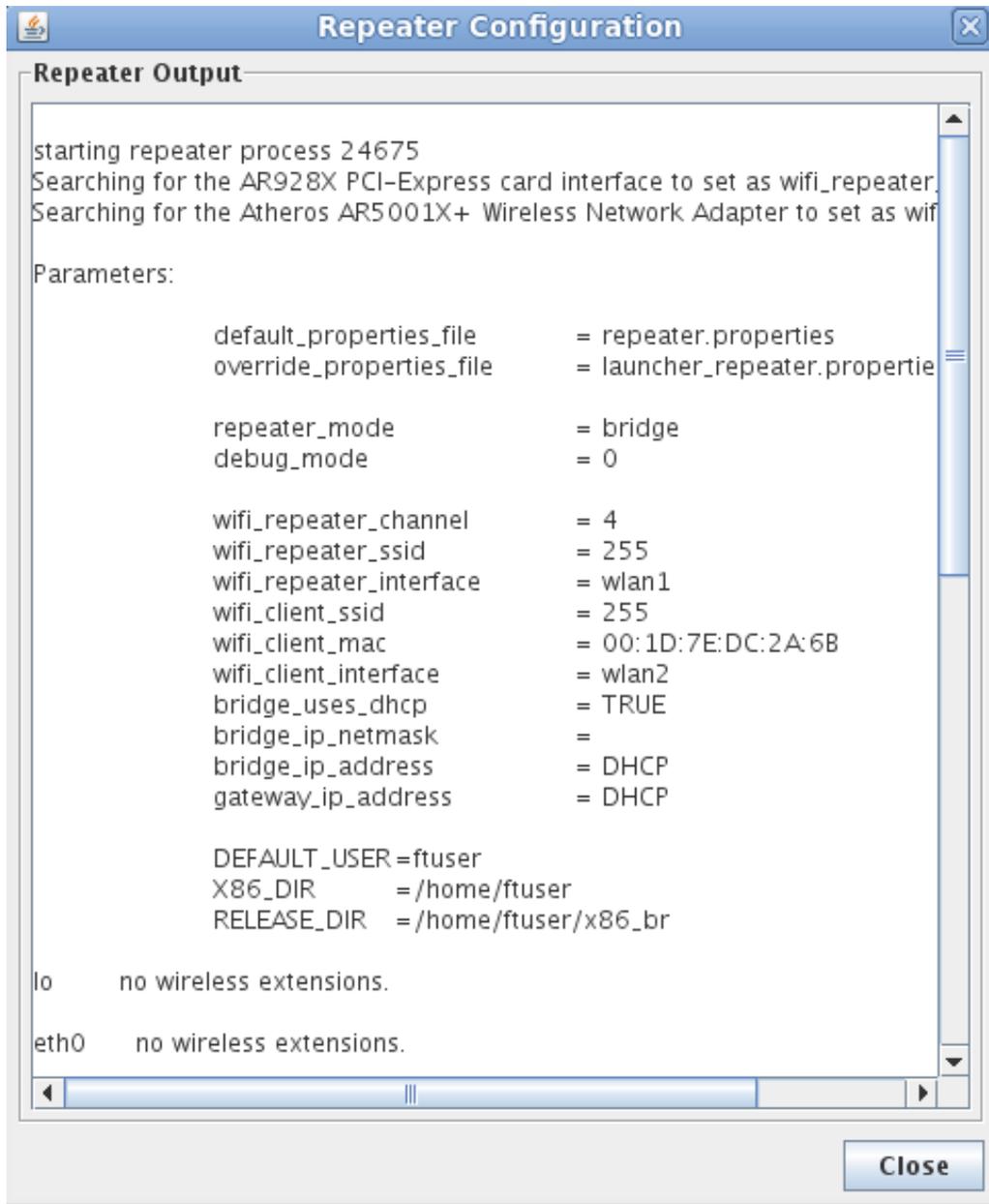
Gateway

Address: 192.168.1.1

Save Start Stop

Quick Start Guide for x86 FT

10. This will display the “Repeater Configuration” GUI (shown below). Status and error messages will display in this GUI. If an error occurs, diagnose according to instructions in section 6.



To stop the x86 FT, click the “Stop” button on the “Network Settings” GUI of step 9. Note: alternatively, you can stop by opening a terminal (Applications -> System Tools -> Terminal), navigating to the ~ftuser/bin directory (`cd ~ftuser/bin`), and running “`sudo ./stop-repeater.sh && sudo ./repeater.sh -d`”).

4.3 Use Case 3: Anonymous Open Wireless Network that Uses a Wired Network Connection for Internet Access

In this use case, the x86 FT establishes an open wireless network. Anonymous wireless clients can connect to the x86 FT to gain internet access. The x86 FT uses the wired interface for internet connectivity. In this case, the x86 FT operates in “router” mode (see 4.4 for a brief discussion of bridge vs. router operation). Operation is as follows:

1. Login to the laptop as “ftuser”. Default password for ftuser is “squid123!” (change the password at your discretion).
2. Remove any PCMCIA and/or Express Cards
3. Insert the Ubiquiti SR71X Express Card
4. Connect and configure internet access for the wired interface. For a GUI to help with this, select System -> Administration -> Network. Then double-click the wired interface entry (typically “eth0”). Deselect the “Controlled by Network Manager” option. To use DHCP (the most common case), select “Automatically obtain IP address settings with DHCP” and select “Automatically obtain DNS information from provider”. Click “OK” and then click the green “Activate” button. Test the internet connection by opening a browser and navigating to a web site.
5. Open a terminal (Applications -> System Tools -> Terminal), navigate to the ~ftuser/bin directory:

```
cd ~ftuser/bin
```

6. Edit the “repeater.properties” file:

```
gedit ~ftuser/bin/repeater.properties &
```

Set the “repeater_mode” field to “router”, the “wifi_client_interface” field to “eth0” (or whatever the wireless interface name is), and the “beacon_address” field to the desired beacon IP address or domain name. For example:

```
repeater_mode=router
wifi_client_interface=eth0
beacon_address=my.server.com
```

NOTE: in repeater.properties, any line starting with a ‘#’ character is ignored (i.e. it is a comment line).

Quick Start Guide for x86 FT

7. Run the “repeater.sh” script with the desired wireless network SSID and channel (the “dummy” argument is required):

```
sudo ./repeater.sh -s dummy -c <CHANNEL> -r <SSID>
```

For example, to create the “FreePublicWifi” wireless network on channel 11, issue:

```
sudo ./repeater.sh -s dummy -c 11 -r FreePublicWifi
```

8. Check the output for errors. If an error occurs, diagnose according to instructions in section 6.

To stop the x86 FT, open a new terminal (Applications -> System Tools -> Terminal), and issue:

```
sudo ./repeater.sh -d
```

4.4 Bridge vs. Router Mode

The x86 FT has two modes of operation, “bridge” and “router”. In bridge mode, the x86 FT operates as a layer 2 bridge. In router mode, the x86 FT operates as a layer 3 router.

Bridge mode is more transparent to the wireless client (i.e. the x86 FT uses the original AP for DHCP), and is easier to configure. The down side is that some AP’s do not support bridging. In this case, router mode must be used. Bridge mode also does not support the VPN Proxy action (but does support the VPN Link action).

Router mode is more robust (i.e., does not require bridging support on the original AP). The down side is that the x86 FT is less transparent to the wireless client (i.e. the wireless client will be on a subnet that is different than the original AP’s), and requires more configuration (i.e. DHCP information must be configured).

5 Windows Look and Feel

The x86 FT runs on Fedora Core 14 linux. However, a Windows Look and Feel package is provided with the x86 FT Software installation. To configure the Windows Look and Feel package:

1. Remove the Desktop and Trash icons from the right side of the lower toolbar:
 - a) Right-click on icon.
 - b) Uncheck the "Lock To Panel" checkbox.
 - c) Right-click on icon again and select "Remove From Panel".
2. Add icon for switching between Linux and Windows 7 themes:
 - a) Right-click on lower menu bar.
 - b) Select "Add To Panel...".
 - c) Double-click "Custom Application Launcher".
 - d) In the "Create Launcher" dialog, enter:
Name: No items in trash
Command: `/usr/local/bin/wlf -t`
 - e) Click on the icon in the upper left corner of the dialog.
 - f) Navigate to and select:
`/usr/share/icons/Windows7/48x48/places/user-trash.png`
 - g) Click "Open".
 - h) Close the prior dialog boxes.

To toggle between the linux and Windows 7 look and feel, click the trash icon.

6 Diagnostics

This section discusses how to diagnose issues with the x86 FT. Common sources include:

- hardware not inserted properly - double check hardware insertion
- no/intermittent internet connectivity – adjust location/antennas
- incorrect beacon address – double check beacon address setting
- kismet.conf not configured with proper wireless interface – see operation use case 1 of section 4.1 step 6.

The most useful diagnostic tool is the x86 FT log. If the x86 FT has been started with the `ftlauncher.sh` GUI (use cases of sections 4.1 and 4.2), the log will display in the “Repeater Configuration” GUI (shown in section 4.1 step 10). If the x86 FT has been started with the `repeater.sh` script, the log will display in the terminal. The log can always be displayed by opening a terminal (Applications -> System -> Terminal) and issuing:

```
tail -f ~ftuser/bin/logs/repeater-<DATE>.log
```

For more serious diagnostics, the debug x86 FT software must be installed. Follow the instructions of section 3, but at the “`install.sh`” command of step 6, run “`./install.sh -d`” instead. Then, edit the `repeater.properties` file. Finally, run the x86 FT as you had prior. The log will now display significantly more diagnostic information.

If the wireless hardware seems to be unresponsive, the best option is to simply reboot.

7 Known Limitation and Issues

The x86 FT has the following known limitations and issues:

- VPN Proxy action does not work in “bridge” mode – use “router” mode if VPN Proxy action support is required. Note that VPN Link action does work in “bridge” mode
- The x86 FT only supports channels 1-11.
- GUI configuration (via ftlauncher.sh) of the x86 FT is only available for use cases of sections 4.1 and 4.2.