

## DD-WRT Firmware on a Linksys WRT54GS router using Milkfish SIP Router

Listed below are the instructions for using DD-WRT firmware on:

- a Linksys wireless WRT54GS router (version 1) using the Milkfish SIP router.
- I also am using a Linksys PAP2 VOIP Phone adapter.

Currently (May 2010) this has been running using Free Phone Line's (FPL) long distance service without issue, no dropped calls, nothing. I also have 4 wired PC's (using another workgroup router) and 3 laptops connecting wirelessly, also with no Internet issues.

I will not go through the flashing procedure as it was quite simple. The one thing to be sure of is to get the proper file from here - <http://www.dd-wrt.com/site/support/router-database> . Simply key in the first few letters of your router model number and search (remember to get the exact version of your router or you could mess this up). From the list I chose the v24 SP1 (Stable) Build 10020 and VOIP Generic bin file as seen below:

Linksys WRT54GS v1.0

Router details

Additional information

Chipset

BCM4712

RAM

32 MB

FLASH

8 MB

Supported by

v24 SP1 [Stable] Build 10020

• These unit seems to run more stable on the [VINT](#) builds.

Description	Filename	Date	Size
Mini-Build required for inital flashing via WEB	<a href="#">dd-wrt.v24_mini_generic.bin</a>	2008-07-27	2,77 MB
VINTAGE : mega	<a href="#">dd-wrt.v24-9517_VINT_mega.bin</a>	2009-02-10	5,25 MB
VINTAGE : micro	<a href="#">dd-wrt.v24-9517_VINT_micro.bin</a>	2009-02-10	1,69 MB
VINTAGE : mini	<a href="#">dd-wrt.v24-9517_VINT_mini.bin</a>	2009-02-10	2,73 MB
VINTAGE : mini_usb	<a href="#">dd-wrt.v24-9517_VINT_mini_usb.bin</a>	2009-02-10	2,94 MB
VINTAGE : nokaid	<a href="#">dd-wrt.v24-9517_VINT_nokaid.bin</a>	2009-02-10	3,36 MB
VINTAGE : nokaid_usb	<a href="#">dd-wrt.v24-9517_VINT_nokaid_usb.bin</a>	2009-02-10	3,52 MB
VINTAGE : openvpn	<a href="#">dd-wrt.v24-9517_VINT_openvpn.bin</a>	2009-02-10	3,57 MB
VINTAGE : standard	<a href="#">dd-wrt.v24-9517_VINT_std.bin</a>	2009-02-10	3,48 MB
VINTAGE : voip	<a href="#">dd-wrt.v24-9517_VINT_voip.bin</a>	2009-02-10	3,54 MB
Mega Generic	<a href="#">dd-wrt.v24_mega_generic.bin</a>	2008-07-27	6,65 MB
Micro Generic	<a href="#">dd-wrt.v24_micro_generic.bin</a>	2009-02-09	1,69 MB
Micro Generic	<a href="#">dd-wrt.v24_micro_olsrd_generic.bin</a>	2009-02-09	1,64 MB
Mini Generic	<a href="#">dd-wrt.v24_mini_generic.bin</a>	2008-07-27	2,77 MB
Xbox no-kaid Generic	<a href="#">dd-wrt.v24_nokaid_generic.bin</a>	2008-07-27	3,32 MB
Standard Generic	<a href="#">dd-wrt.v24_std_generic.bin</a>	2008-07-27	3,59 MB
Standard Generic	<a href="#">dd-wrt.v24_usb_generic.bin</a>	2009-02-09	3,84 MB
VoIP Generic	<a href="#">dd-wrt.v24_voip_generic.bin</a>	2008-07-27	3,55 MB
VPN Generic	<a href="#">dd-wrt.v24_vpn_generic.bin</a>	2008-07-27	3,53 MB

**Step 1 Static IP Lease on ATA-** To start, we need to first get a static IP address lease set up for the Linksys ATA. The most recent Linksys firmware did not allow this and it did cause me problems. Whenever the DHCP on the router would renew if the ATA did not get the same IP address, all of the routing was messed up and the phone did not work. The Linksys ATA, like any device can be set up using DHCP or a static address. FPL requires it to use DHCP. So under the Services tab, and Services sub tab (below it), you need to assign a static reserved IP address to your ATA as seen below (note: you do need to find you MAC Address for your device):

**DD-WRT Control Panel**  
 Firmware: DD-WRT v24-sp1 (07/27/08) voip  
 Time: 06:44:42 up 1 day, 20:15, load average: 0.24, 0.10, 0.02  
 WAN IP: [REDACTED]

Setup | Wireless | **Services** | Security | Access Restrictions | NAT / QoS | Administration | Status

**Services** | PPTP | Hotspot | Milkfish SIP Router | My Ad Network

**Services Management**

**DHCP Client**  
 Set Vendorclass: [Text Field]  
 Request IP: [Text Field]

**DHCP Server**  
 Use JFFS2 for client lease DB: (Not mounted)  
 Use NVRAM for client lease DB: ☐  
 Used Domain: WAN [Dropdown]  
 LAN Domain: [Text Field]  
 Additional DHCPd Options: [Text Area]

**Static Leases**

MAC Address	Host Name	IP Address
[Text Field]	[Text Field]	[Text Field]
[Text Field]	[Text Field]	[Text Field]
[Text Field]	[Text Field]	[Text Field]

[Add] [Remove]

DNSMasq

Help  
More...

Adding in your MAC Address, the Lease name (I just used LinksysATA), and the desired IP reservation is all you need to do. Do not click the Add button; it only adds another line to the list. You need to hit save at the bottom of the page.

If this is not done, your router may assign a different address and the Forwarding in the next step will need to be modified every time your address changes (or of course your phone won't work).

*Please also note: I have not been able to see that any reservation list exists, so after you do it and save it, it does not appear. However, if you try to assign that same IP address to another device, it will tell you it is reserved.*

**Step 2 Port Forwarding-** The next step is to ensure that the ports are forwarding to the Linksys ATA. To do this, go to NAT / Qos in the menus. You can do exactly as I've done below, just be sure to change the IP address section to the IP address you chose in step 1 as your Static Lease address.

The screenshot shows the DD-WRT Control Panel with the 'NAT / QoS' menu selected. Under 'Port Forwarding', the 'Port Range Forwarding' sub-menu is active. A table titled 'Forwards' lists four entries:

Application	Port from	Protocol	IP Address	Port to	Enable
FPL	5061	UDP	192. [redacted]	5061	<input checked="" type="checkbox"/>
FPL	5062	UDP	192. [redacted]	5062	<input checked="" type="checkbox"/>
FPL	10000	UDP	192. [redacted]	20000	<input checked="" type="checkbox"/>
	0	Both	0.0.0.0	0	<input type="checkbox"/>

Buttons at the bottom include 'Add', 'Remove', 'Save', 'Apply Settings', and 'Cancel Changes'.

*Note here: FPL recommends ports 5060 and 5061 in their setup for two phone lines. At some point I had a problem with port 5060 on my router. I simply changed to 5061 and 5062, and as long as I kept that going forward with the other settings, all was fine.*

**Step 3 DMZ (optional)** – I have not had to do this, but it was suggested to me that I may want to add my Linksys ATA into the DMZ zone. This means that basically my ATA will be outside my router and on the Internet on its own. If you do this, be sure to have a login and password that is strong, as it can get hacked.

The screenshot shows the DD-WRT Control Panel with the 'DMZ' sub-menu selected under 'NAT / QoS'. The 'Demilitarized Zone (DMZ)' section shows:

**DMZ**

Use DMZ: ☐ Enable ☒ Disable

DMZ Host IP Address: 192. [redacted]

Buttons at the bottom include 'Save', 'Apply Settings', and 'Cancel Changes'.

Staying in NAT / QoS, simply click on DMZ, and enable. Ensure the IP address of your ATA is listed. Hit save. If you experience problems with calls, try putting your ATA in the DMZ and see if it resolved the issues. As I said, I have not had to, but may need to in the future.

#### **Step 4 – Setting the Milkfish SIP Router Settings**

To start setting up the Milkfish SIP Router, click on Services, then Milkfish SIP Router. Use the settings as they appear in the picture below. I have not had to stray from this at all. Someone better than I can say if there are better options, but this works for me.

**SIP Status** you can leave for the time being as we need to do something in the ATA. Until then the status may error on you.

The screenshot shows the DD-WRT Control Panel interface. At the top, the DD-WRT logo is on the left, and system information is on the right: Firmware: DD-WRT v24-sp1 (07/27/08) voip, Time: 07:37:52 up 1 day, 21:08, load average: 0.18, 0.12, 0.04, and WAN IP: [redacted]. Below this is a navigation bar with tabs: Setup, Wireless, Services (highlighted with a red box), Security, Access Restrictions, NAT / QoS, Administration, and Status. Under the Services tab, there are sub-tabs: Services, PPTP, Hotspot, Milkfish SIP Router (highlighted with a red box), and My Ad Network. The main content area is titled "Milkfish SIP Router". It contains several settings: Main Switch (radio buttons for Enable and Disable, with Enable selected), From-Substitution (radio buttons for Enable and Disable, with Disable selected), From-Domain (text input field), Milkfish Username (text input field), Milkfish Password (text input field), SIP Trace (radio buttons for Enable and Disable, with Disable selected), and Dynamic SIP (radio buttons for Enable and Disable, with Disable selected). Below these settings are several expandable sections, each with a title and a button: SIP Status (SIP Status button), SIP Phonebook (SIP Phonebook button), SIP Database (Local Subscribers and Local Aliases buttons), SIP Messaging (SIP Messaging button), SIP Trace (SIP Trace button), and Dynamic SIP (Advanced DynSIP Settings button).

Once set up and functional clicking on the SIP Phonebook will bring up a registration screen of your phone numbers you are using along with port number internally. I'll ignore that for now, you can look at any time.



You must click on the **SIP database – Local Subscribers** and set up your FPL Phone Numbers. The screen below is what you will see:

**SIP Database**

**Local Subscribers**

User	Password
1289 [masked]	[masked]
1289 [masked]	[masked]

All you need to do on this screen is enter in your FPL number including the 1 and your FPL password for that line. If you have more than a couple of phone numbers, you can hit ADD for more available Subscribers (numbers). Once done hit save.

Everything else on the Milkfish setup I have left as is as I have not needed it for my phone / long distance to function properly.

### Step 5 – Setting the Proxy For Your ATA

This was my last step. I could not use my long distance capabilities until this was done.

We need to tell the ATA device how to get out for dialling and receiving calls. To do this log in to your ATA through your web browser. Switch to Admin login and advanced view. Next choose Line 1 or Line 2, and scroll down to Proxy and registration. As seen in the screen shot below, your Proxy should be voip.freephoneline.ca, but your outbound Proxy should be the IP address of your actual router (not 192.X.X.X as I have put). Also, change the Use Outbound Proxy setting to **YES**. Click save at the bottom of the page.

**Proxy and Registration**

Proxy: voip.freephoneline.ca

Outbound Proxy: 192.X.X.X

Register: yes

Register Expires: 180

Use DNS SRV: no

Proxy Fallback Intvl: 3600

Voice Mail Server: [empty]

Use Outbound Proxy: yes

Use OB Proxy In Dialog: yes

Make Call Without Reg: no

Ans Call Without Reg: no

DNS SRV Auto Prefix: no

Proxy Redundancy Method: Normal

Mailbox Subscribe Expires: 2147483647

That is it! You should now be able to function and use your phone for making and receiving regular and long distance calls.

Good luck and message me on here if you are unsure of any setting, of if you've found something missing or an error in my notes.

Marksy