Linksys WRT54G series

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(Redirected from WRT54G)

Linksys WRT54G (and variants **WRT54GS**, **WRT54GL**, and **WRTSL54GS**) is a Wi-Fi capable residential gateway from Linksys. The device is capable of sharing Internet connections amongst several computers via 802.3 Ethernet and 802.11b/g wireless data links.

The WRT54G is notable for being the first consumer-level network device that had its firmware source code released to satisfy the obligations of the GNU GPL. This allows programmers to modify the firmware to change or add functionality to the device. Several third-party firmware projects provide the public with enhanced firmware for the WRT54G. *See Third party firmware projects*. This product has been known to be well suited for small businesses.

Linksys WRT54G version 3.1

Linksys WRT54G version 1.0


Linksys WRT54GS version 1.1

Linksys WRT54GX version 2

The WRT54G is also quite notable for being a piece of networking equipment that even novice home computer u sers understand and use each day. The WRT54G can be thought of as bridging the gap between high-end commercial networking and the now-booming home networking.

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Hardware and revisions

WRT54G

The original **WRT54G** was first released in 2003. It comes with a 4+1 port network switch (the Internet/WAN port is also in the same internal network switch, but on a different VLAN). The devices have two removable antennas connected through Reverse Polarity TNC connectors. The WRT54GC router is an exception and has an internal antenna with optional external antenna. As a cost-cutting measure, the design of the latest version of the WRT54G no lon ger has detachable antennas or TNC connectors. Instead, version 8 routers simply route thin wires into antenna 'shells' eliminating the connector. As a result, Linksys HGA7T and sim ilar external antennas are no longer compatible with this model.

Version	CPU speed	RAM	Flash memory	S/N Prefix[1]	Notes
1.0	125 MHz	16 MB	4 MB	CDF0 CDF1	20 front panel LEDs (including link/activity, collision detection and speed rating indicators for each RJ-45 port). Wireless capability was provided by a Mini PCI card attached to the router motherboard.
1.1	125 MHz	16 MB	4 MB	CDF2 CDF3	Front panel LEDs reduced to eight (one link/activity LED per port, plus one each for power, wireless, DMZ and WAN/Internet connectivity). Wireless chipset is integrated onto motherboard.
2.0	200 MHz	16 MB	4 MB	CDF5	Same as 1.1 with a CPU upgrade and greater wireless transmitter integration (fewer transmitter parts). Some of these have 32 MB of RAM but are locked to 16 MB in the firmware (can be unlocked to use all RAM) .
2.1	216 MHz	16 MB	4 MB	CDF6	Same physical appearance as 1.1 and 2.0 models. Some of these models have 32 MB of RAM installed but have b een locked to 16 MB by the manufacturer. Some models have two 16 MB MIRA P2V28S40BTP memory chips.
2.2	216 MHz	16 MB	4 MB	CDF7	Same physical appearance as 1.1 and 2.0 models. Switching chipset from ADMtek 6996L to Broadcom BCM5325EKQM. Some of these models have 32 MB of RAM installed but have been locked to 16 MB by the manufacturer. Some mo dels have 16 MB Hynix HY5DU28162ET-J memory chips.
3.0	216 MHz	16 MB	4 MB	CDF8	Identical to 1.1 and later models, except for the CPU speed and an undocumented switch behind left front pa nel intended for use with a feature called "SecureEasySetup".
3.1	216 MHz	16 MB	4 MB	CDF9	The Version 3.1 hardware is essentially the same as the Version 3.0 hardware. Adds "SecureEasySetup" button .
4.0	200 MHz	16 MB	4 MB	CDFA	Broadcom BCM5352EKPB Chipset
5.0	200 MHz	8 MB	2 MB	CDFB	Broadcom BCM5352EKPB Chipset - Switched to VxWorks OS and reduced Flash Memory and RAM; not compatible with most 3rd party firmware.
5.1	200 MHz	8 MB	2 MB	CDFC	Broadcom BCM5352EKPB Chipset
5.?	200 MHz	8 MB	2 MB	CDFB	Broadcom BCM5352EKBG Chipset
6.0	200 MHz	8 MB	2 MB	CDFD	Broadcom BCM5352EKBG Chipset
7.0		8 MB	2 MB	CDFE	Atheros AR2317 Chipset
8.0	240 MHz	8 MB	2 MB	CDFF CDFG	Broadcom BCM5354KFBG Chipset with non-replaceable antennas.

WRT54GS

The **WRT54GS** is nearly identical to WRT54G except for additional RAM, flash memory, and SpeedBooster software. Versions 1 to 3 of this router have 8MB of flash memory. Since most third parties' firmware only use up to 4MB flash, a JFFS2 based r/w filesystem can be created an d used on the remaining 4MB free flash. This allows for greater flexibility of configurations and scripting, enabling this small router to both load balance multiple ADSL lines (multi homed) or to be run as a hardware layer 2 load balancer (with appropriate third party firmware).[2]

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	200 MHz	32 MB	8 MB	CGN0 CGN1	Added SpeedBooster technology (Broadcom Afterburner technology), claims to boost the throughput of 802.11g by 30% (for maximum boost needs SpeedBooster technology on the other side, but will boost standard 802.11g as well)
1.1	200 MHz	32 MB	8 MB	CGN2	Chipset changed from ADMtek 6996L to Broadcom BCM5325EKQM.
2.0	216 MHz	32 MB	8 MB	CGN3	10 LED Front Panel (two new ones behind Cisco logo button). Also capable of SecureEasySetup, but use of the logo button and lighting of the new LEDs behind it requires firmware upgrade.
2.1	216 MHz	32 MB	8 MB	CGN4	Radio chip is changed from BCM2050 to BCM2050KML.
3.0	200 MHz	32 MB	8 MB	CGN5	Use System-on-Chip: processor, MAC, and switching are handled by Broadcom BCM5352EKBP.
4.0	200 MHz	16 MB	4 MB	CGN6	Reduced RAM & Flash
5.0	200 MHz	16 MB	2 MB	CGN7	Uses VxWorks OS and reduced Flash Memory; not compatible with most 3rd party firmware.
5.1	200 MHz	16 MB	2 MB	CGN8	
6.0	200 MHz	16 MB	2 MB	CGN9	
7.0	240 MHz	16 MB	2 MB	CGNA CGNB CGNC	Broadcom BCM5354KFBG Chipset

WRT54GL

Linksys released the **WRT54GL** in 2005 to support third-party firmware based on Linux, after the original WRT54G line was switched from Linux to VxWorks, starting with version 5.

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	200 MHz	16 MB	4 MB	CL7A	New model line, released after the version 5 WRT54G, which returns to a Linux-based OS as opposed to the Vx Works firmware. SpeedBooster is not enabled in stock firmware, however third-party firmware will enable the feature. The hardware is es sentially the same as the WRT54G version 4.0. One alteration is that the internal numbering scheme of the 4-port swit ch changed in this model, from 1 2 3 4, to 3 2 1 0.
1.1	200 MHz	16 MB	4 MB	CL7B CL7C	In June 20, 2006, this version was shipping with firmware revision 4.30.7. This pre-loaded firmware allows the user to upload a 4MB firmware image, whereas the pre-loaded firmware on version 1.0 limited the image to 3MB. Firmware versi on 4.30.11 is now available for both hardware versions. Fully supported by Tomato, openwrt, and DD-WRT.
1.1	200 MHz	32 MB	8 MB	CO61	T-Mobile Special Edition WRT-54GL (Renamed WRT54G-TM).

WRTSL54GS

WRTSL54GS is similar to the **WRT54GS**
while adding additional firmware features and a USB 2.0 port (referred to as StorageLink) which can be used for a USB hard disk or flash drive.[3]

Unlike other models, the WRTSL54GS only has one antenna.

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	264 MHz	32 MB	8 MB	CJK0	Released after the WRT54GS and WRT54GL. Uses Linux-based OS. Includes SpeedBooster support, additional firmware features, and an external USB 2.0 port (StorageLink) for network storage. Uses 8 MB of Intel TE28F640 flash with a Broadcom BCM4704KPB processor and Broadcom BCM5325FKQM Ethernet switch.
1.1	264	32 MB	8 MB	CJK11	Change from BCM4704 rev 8 to BCM4704 rev 9 uncomfirmed

WRT54GX

WRT54GX comes with SRX (Speed and Range eXpansion), which utilizes True MIMO technology by Airgo Networks. It has 3 antennas and was once marketed as a 'Pre-N' router, with 8 times the speed and 3 times the range over standard 802.11g routers.

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	300 MHz	16 MB	4 MB	KBG5?	Wireless-G Broadband Router with SRX. Uses the Broadcom 4704 Chipset
2.0	200 MHz	32 MB	8 MB	KIO1?	Wireless-G Broadband Router with SRX. Uses the Realtek RTL8651B Chipset

WRT54GP2

WRT54GP2 has 1 or 2 antennas, and a built-in analog telephony adapter (ATA) with 2 phone lines, but only 3 network ports.

Version	Locked to	RAM	Flash memory	S/N Prefix	Notes
EA	Engin	xx MB	x MB	CJJ0	Wireless-G Broadband Router with 2 Phone Ports. Uses the Marvel Chipset

WRT54GX2

WRT54GX2 has 2 antenna, and was advertised to have 6 times the speed and 2 times the range over standard 802.11g ro uters.

WRT54GX4

WRT54GX4 has 3 moveable antennas, and is advertised to have 10 times the speed and 3 times the range over standard 802.11g routers.

WRT51AB

WRT series with 802.11a support. (First Generation)

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	125 MHz	32 MB	4 MB	MCH0	Broadcom Chipset 2 mini-PCI Slots one A one B, Switch BCM5325A2KQM, CPU BCM4702KPB

WRT55AG

WRT54G series with 802.11a support.

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	125 MHz	32 MB	4 MB	??	Broadcom BCM4710 Chipset 2 mini-PCI Slots
2.0	200 MHz	16?? MB	4?? MB	??	Broadcom chipset (vxworks bootloader?? Switch does not work with DD-WRT)

WTR54GS

A compact wireless travel router with SpeedBooster support, it only has 1 RJ-45 output.

Version	CPU speed	RAM	Flash memory	S/N Prefix	Notes
1.0	200 MHz	16 MB (IC42S32400)	4 MB (29LV320ABTC)	SJH0	Broadcom BCM5350KPB2 Chipset. Supported in DD-WRT v24 RC5 builds. See here (http://www.dd-wrt.com/phpBB2/viewtopic.php?t=21959&postdays=0&postorder=asc&start=0) for flashing instructions.
2.0	200 MHz	8 MB	2 MB	SJH1	Broadcom BCM5350KPB2 Chipset. Supported in DD-WRT v24 RC5 Micro builds. See here (http://www.dd-wrt.com/phpBB2/viewtopic.php?t=21959&postdays=0&postorder=asc&start=0) for flashing instructions.
2.1	200 MHz	8 MB	2 MB	SJH2	Broadcom BCM5350KPB2 Chipset. Supported in DD-WRT v24 RC5 Micro builds. See here (http://www.dd-wrt.com/phpBB2/viewtopic.php?t=21959&postdays=0&postorder=asc&start=0) for flashing instructions.

WRT54GC

WRT54GC series with 802.11b/g support. This unit has a four port 10/100 switch and one WAN port. The "C" in the router number stands for compact, as the unit measures 4" by 4" by 1" with an internal antenna. The unit can be expanded with addition of HGA7S external antenna to boost r ange. Hardware Version 1.0 is only option available in the United States since introduction in 2005.

Version 2.0 is shipping in, amongst other countries, the United Kingdom. This unit has a non-detachable ext ernal antenna.

The internal hardware is based on a Marvell ARM914 ("Libertas") reference design which is probably identica l to the SerComm IP806SM, Xterasys XR-2407G, Abocom ARM914, Hawking HWGR54 Revision M, and the Airlink 101 AR315W. By appropriately changing the value of the firmware byte 0x26, the WRT54GC can be cross-flashed with firmware based on the same reference platform.

There are reports that a sister platform of the WRT54GC (the AR315W) has been hacked to run Linux. [4]

WRT54G3G Mobile Broadband router

A variant which has 4 ethernet ports plus a PCMCIA slot for use with a Sprint Nextel "aircard" which supports CDMA 1X and EVDO rev A wireless internet.

WRT54G-TM

The WRT54G-TM (TM stands for T-Mobile) is also called the T-Mobile "Hotspot@Home" service. It allows calls to be made via T-Mobile's GSM network or via WiFi, using the same telephone and phone number (a special dual-mode phone designed for the service is required). Additiona lly, once a call is in progress, one may transition from WiFi to GSM (or the other way 'round) seamlessly, as WiFi signal comes and goes, such as when entering or exiting a hom e or business. A special router is not needed to use the service, but the T-Mobile branded routers are supposed to enhance the telephone's battery life. This is the only known tweak to the TM version of the firmware. The hardware appears to be like WRT54GL however has 32 ram and 8 Meg flash, with five RJ-45 ports (four LAN plus "internet"). There are no RJ-11 telephone ports nor SIM slots as was once rumored. Upgrading to third party firmware via JTAG method, upgrade CFE to WRT54GL 1.1, allows flash upgrade as the stock WRT54G-TM CFE prevents third party firmware upgrades.

Third-party firmware projects

Although listed here under Linksys, many of these will run on other brands of Linux-based devices, such as the Buffalo network-attached storage series. The extent of support for (and testing on) particular hardware varies from project to project.

- Major Projects
  - **DD-WRT**[5] Paid and free versions available. Include lots of different features. (Linux/GPL)
  - **HyperWRT Thibor**[6] Firmware based on stock WRT54GS firmware, HyperWRT +tofu and other additions.
  - **OpenWrt**[7] A very customizable firmware written from scratch with a JFFS2 file system for package management aimed mostly toward advanced users. (Linux/GPL)
  - **X-Wrt**[8] Extension of OpenWrt for the end-user with a web-management console with more than 40 control and status p ages for a router. (Linux/GPL)
  - **Sveasoft**[9] Paid and free versions available. Latest versions available via subscription.
  - Tomato (http://www.polarcloud.com/tomato)
    HyperWRT-based firmware aimed to be easy, stable and fast. Features advanced QoS and a number of web innova tions such as Ajax and SVG graphs. The Tomato Manual is available at Wikibooks. (Linux/GPL)
- Minor projects
  - BatBox (http://www.batbox.org/wrt54g-linux.html) - RAM based distribution for experimenting, does not change firmware
  - Bluebox (http://www.linksysco.com/) - Automatic open Internet scanning and bridging software that runs on WRT54G with OpenWRT.
  - Chillispot - Captive portal software that runs on WRT54G and other platforms, available under GPL
  - Coova - OpenWrt based but with focus on Wireless Hotspot functionality.
  - Earthlink's IPv6 Firmware - IPv6 feature added to original Linksys firmware (beta-test version)
  - EzPlanet (http://www.ezplanetone.com/xwiki/bin/view/Router/) - Enhanced firmware based on DD-WRT v24 and including Layer 2 Load Balancer
  - FON - Chillispot-based worldwide Hotspot network. After unsuccessfully attempting to develop a version that supports 2 SSID s (one private, one public), FON abandoned the WRT54G series, and now distributes a router called La Fonera, which does support 2 SSIDs.
  - FreeWRT - Experimental firmware based on OpenWrt.
  - Freifunk - German software supports wireless mesh networks with OLSR, based on OpenWrt
  - Meraki - Mesh Networking Wifi AP developed thru Roofnet project, based on OpenWrt.
  - OpennetFirmware - Firmware based on OpenWrt and parts of Freifunk.
  - PacketProtector (http://packetprotector.org) - OpenWrt-based security distribution that includes IDS, IPS, VPN, and web antivirus capabilities
  - TinyPEAP - Secure wireless authentication feature added to Linksys firmware
  - WiFi-Box[10] - (no documentation available as of January 2006)
  - Neighbornode
  - **Tarifa**[11] - Based on stock WRT54GL firmware.
  - WiFiDog Captive Portal - WiFi Dog by Ile Sans Fil, a Captive Portal software that runs on the OpenWrt platform
  - **WifiTastic**[12] - Hotspot solution for home or small business use. Features credit card billing. Runs on the OpenWrt platf orm
  - Wirds.net (http://wirds.net/) A project which uses freifunk firmware with chillispot captive portal and worldspot.net (http://worldspot.net/) authentication.
- Deprecated projects (no longer maintained)
  - EWRT (http://www.portless.net/menu/ewrt/) - Enhanced WRT, with integrated captive portal based on NoCatSplash
  - HyperWRT
    - Original power boost firmware project by Avenger 2.0 to stay close to official WRT54G and WRT54GS firmwar e but add features such as transmit power, port

triggers, scripts, telnet, etc.
- HyperWRT +tofu (http://www.polarcloud.com/tofu) - Based on stock WRT54GS firmware, HyperWRT and some additions.
- Rupan HyperWRT - Based on stock WRT54G firmware and HyperWRT.

Hardware versions affect firmware compatibility

As of January 2006, most third-party firmware is no longer compatible with version 5 of both the WRT54G and the WRT54GS. The amount of flash memory in the version 5 devices has been reduced to 2 MB, too small for current Linux-based third-party firmware. (See table above for info rmation on identifying the version based on the serial number printed on the bottom of the unit, and on the outside of the shrink-wrapped retail box.)

Some users have succeeded in flashing and running a stripped down but fully functional version of DD-WRT ca lled 'micro' on a version 5 WRT54G.[13][14] An easier method not requiring any disassembly of the device has since been devised for flashing v5-v8 to DD-WRT.[15][16]

To support third-party firmware, Linksys has re-released the WRT54G v4, under the new model name **WRT54GL** (the 'L' in this name allegedly stands for 'Linux').

CPU

According to OpenWrt,[17] the Linksys WRT54G series use several different processors, all of them 32-bit MIPS architecture processors manufactured by Broadcom.

Performance

The WRT54G CPU can be overclocked using a third-party firmware, such as DD-WRT. Overheating may accompany overclocking since the CPU does not have a heatsink. The router temperature can be lowered by adding a fan to the WRT54G casing[18]
which can be powered externally or wired into the router's main power. Attaching a small heatsink, such as a video card heatsink, to the router's CPU will also help dissipate the heat. The CPU can be identified from its Broadcom label.

Some performance issues have been encountered with the Linksys firmware which may cause sluggish or total n etwork failure. This is usually caused by a large amount of connections clogging the router[19]. Installing a third party firmware and increasing the maximum ports setting to allow more connections is t he usual solution(in DD-WRT found under Administration->Management->Maximum Ports).

Case fan wired into WRT54G power.

Front view of case fan mod.

Bottom of motherboard with red and black wires from fan soldered to router's power.

References

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3. ^ WRTSL54GS, Wireless-G Media Storage Link Router with SpeedBooster (http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US%2FLayout&cid=1141370289678&pagename=Linksys%2FCommon%2FVisitorWrapper) . Linksys. Retrieved on 2007-04-27.
4. ^ Linux hacked onto $20 wireless 802.11b/g router (http://linuxdevices.com/news/NS7186776945.html) . Linux Devices (2006-08-11). Retrieved on 2007-04-27.
5. ^ DD-WRT project site (http://www.dd-wrt.com/)
6. ^ HyperWRT Thibor (http://www.thibor.co.uk/) , a GPL project for the Linksys WRT54G series routers
7. ^ OpenWrt - Wireless Freedom (http://openwrt.org/)
8. ^ X-Wrt - End-user adaption of OpenWrt (http://x-wrt.org)
9. ^ Sveasoft Inc. (http://www.sveasoft.com/) Stockton, California USA
10. ^ WIFI-BOX - WRT54G(s) (http://sourceforge.net/projects/wifi-box/) , GPL Firmware
11. ^ Tarifa (http://tarifa.sourceforge.net/)
12. ^ WifiTastic (http://www.wifitastic.com/)
13. ^ V5 possibilities (http://forum.bsr-clan.de/ftopic5643-60.html) . Berliner Quakeforen (2006-03-31). Retrieved on 2007-04-27.
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17. ^ OpenWrt - TableOfHardware (http://wiki.openwrt.org/TableOfHardware?action=show)
18. ^ Linksys WRT54G Cooling Hack (http://www.daleholley.com/linksys/linksys.htm)
19. ^ [1] (http://www.dd-wrt.com/wiki/index.php/Router_Slowdown)

See also

- WRT150N/WRT300N
- WRTP54G

External links

- Official WRT54G description (http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US%2FLayout&cid=1149562300349&pagenam e=Linksys%2FCommon%2FVisitorWrapper) page at the Linksys website
- Official WRT54GC description (http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US%2FLayout&cid=1115416825655&pagenam e=Linksys%2FCommon%2FVisitorWrapper&lid= page at the Linksys website
- Official WRT54GL description (http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US%2FLayout&cid=1133202177241&pagenam e=Linksys%2FCommon%2FVisitorWrapper&lid= page at the Linksys website
- Official WRT54GS description (http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US%2FLayout&cid=1148435315453&pagenam e=Linksys%2FCommon%2FVisitorWrapper&lid= page at the Linksys website
- Official WRT54GX4 description (http://www.linksys.com/servlet/Satellite?c=L_Product_C2&childpagename=US%2FLayout&cid=1130279435381&pagenam e=Linksys%2FCommon%2FVisitorWrapper&lid= page at the Linksys website

- T-Mobile WRT54G-TM features and technical specifications (http://support.t-mobile.com/knowbase/root/public/tm51417.htm?)
- Product description, firmware upgrades & discussion (http://www.formalid.com//index.php?/archives/4-The-Linksys-WRT54G-Series-router-Flashed.html)
- Information site dedicated to the LinkSys WRT series (http://www.wrtrouters.com)

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