



Linux on Soho-Router

Linux on Linksys, Netgear und D-Link

by Jens Kühnel

freelance linuxtrainer
(SuSE and RedHat certified.)

bookauthor of

„Samba3 - Wanderer zwischen den Welten“



Topic

- Introduction
- Linksys
 - Hardware
 - Version
 - CPU
 - RAM / Flash
 - Network
 - Serial interface
 - Software
- D-Link
- NetGear



Introduction

Linux as default

- delivery status is Linux

- Why

- it's fun
- additional features
- cheap Linux Computer
- low power consumption

- Whats possible

- VPN-encryption
- Routing, Firewalling and QoS



similarities

- CPU is MIPS-based
- delivery status with Linux, μ libc, busybox, iptables, etc.
- the manufacturer had to be forced to comply with GPL.
- Special Thanks to Harald Welte see website <http://www.gpl-violations.org>

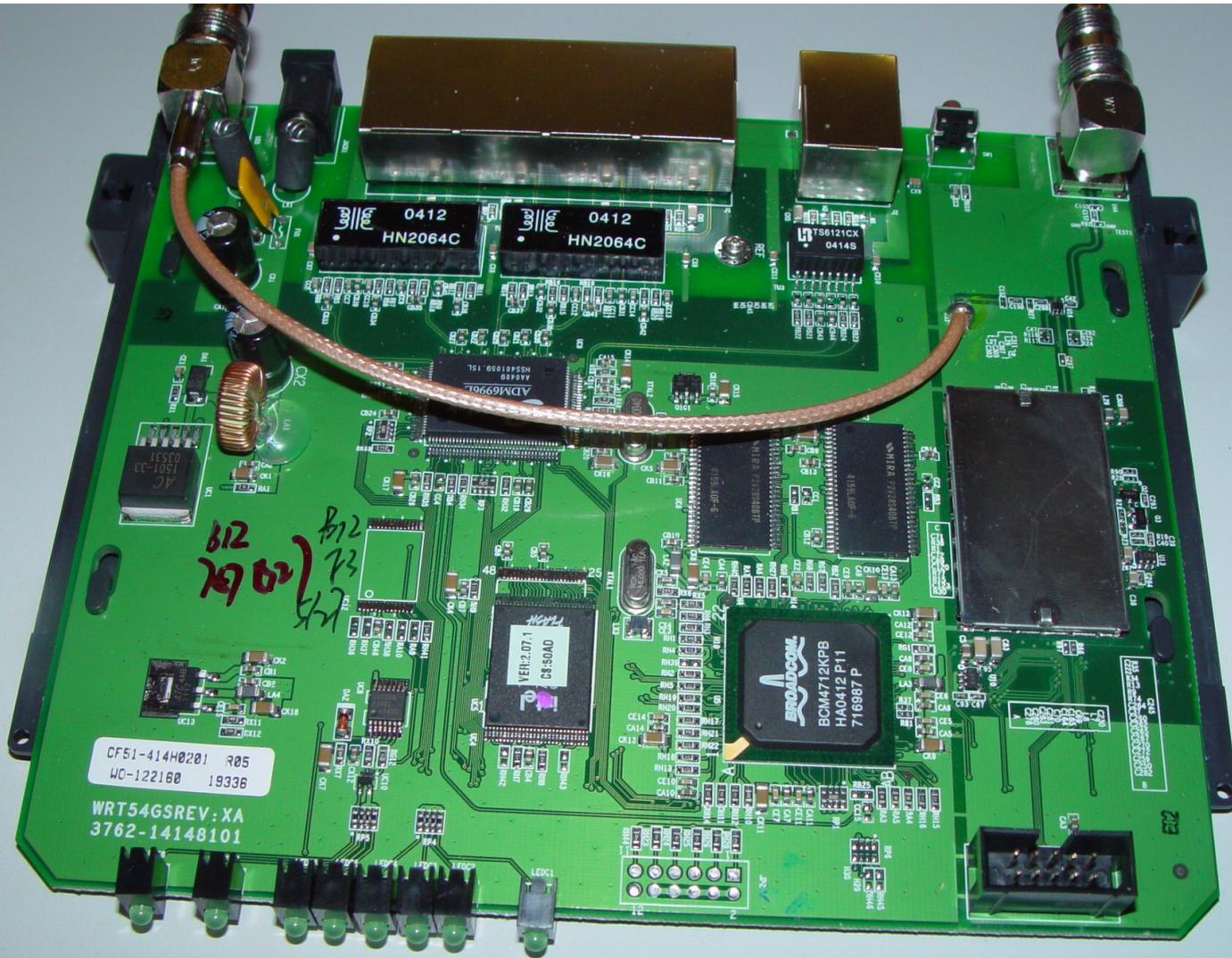


Linksys

Asus
Buffalo
Motorola
Siemens



Hardware





Versions

- WRT54G ~60-80€
 - Version 1.x
 - 125MHz CPU
 - 4MB Flash 16MB RAM
 - Version 2.x
 - 200MHz CPU
 - 4MB Flash 16MB RAM
- WRT54GS Speedbooster ~80-100€
 - 200MHz CPU
 - 8 MB Flash 32MB RAM



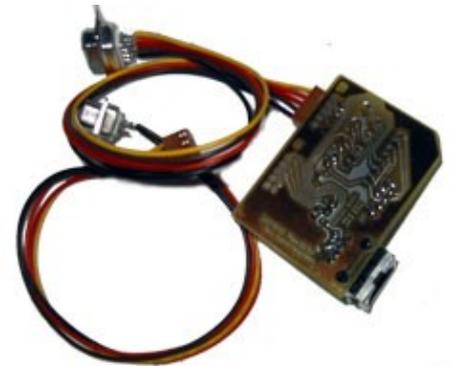
Ethernet / WLAN

- Two Ethernet interface
 - eth0
 - 6-port VLAN-capable Switch
 - VLAN1 Internet-Port (0)
 - VLAN0 remaining 4 Ports (1-4)
 - CPU-Port eth0 (5)
 - VLANs can be totally reconfigured
 - for example an IP for every port
 - eth1
 - WLAN
 - Version1.0 has a Mini-PCI-Card
 - all other versions builtin
 - bridging between eth1 and vlan0 as a default
- Attention: G V1.0 has other VLANs and eths



Serial Ports

- all versions have 2 serial Ports (Connector JP1)
- needs a Level-Converter like a Max3232
- A lot of designs are available in the Net:
- Recommendation:
<http://hamburg.freifunk.net/twiki/bin/view/Technisches/WRT54gSerielleSchnittstelle>





Serial Ports / JTAG

- Port 0 is used for Kernelmessages by original Linksys-firmware and all other
- makes it possible to repair a broken Firmware and gives a login if configured
- second serial Port for Modem-fallback or other serial devices like gps or palm (see palmorb.sf.net).
- JTAG = Development access available (JP2)



Software

Software for the Linksys



Linksys-Firmware

- original Software from Linksys is available under the GPL
- BatBox hacks the original version with the help of the Ping-Bug
<http://www.batbox.org/wrt54g-linux.html>
- after a reboot all changes are cleared



Flashing the Firmware

- Not original Linksys-Firmware voids warranty by Linksys.
- nvram-Variable `boot_wait`
 - wait a couple of seconds with the IP 192.168.1.1 (not changable) for a tftp connection
 - The file from the tftp connection is checked and written to flash
 - Set the `boot_wait` with the help of the ping-“Bug”
 - <http://www.openwrt.org/OpenWrtDocs/Installing>
- or with the webinterface
 - always set `boot_wait`! (automatic set by some Firmware versions)



other Linksys-FW

- The following distributions are based on the original Linksys-Version:
 - HyperWRT
 - Sveasoft
 - EWRT
 - Wifi-Box

- OpenWRT



HyperWRT

- Original Linksys-Software with special „selected“ Enhancements
 - WiFi-Power selectable
 - more Port-Forwarding, Trigger and Qos
 - command shell
 - telnet daemon
 - startup & firewall scripts
 - uptime



Sveasoft

- very extensive enhancements of the Linksys software
- current binary „Alchemy“ only available for 20\$ per year subscription
- The company has a very strange attitude towards GPL
 - see <http://slashdot.org/~TheIndividual/journal/>
- very popular for beginners
- Don't use it, because of the licencing problem



EWRT und Wifi-Box

- Enhanced WRT Linux
 - prepared as a Hot-Spot-in-a-Box
 - NoCatSplash
- Wifi-Box
 - another enhanced version



OpenWRT

- minimal linux with a packetmanagement
- a lot of advancements (packages) available
- no Webinterface, but telnet and ssh available
- configured by /etc
- problems with WRT54Gv2.2 and WRT54GSv1.1 are solved



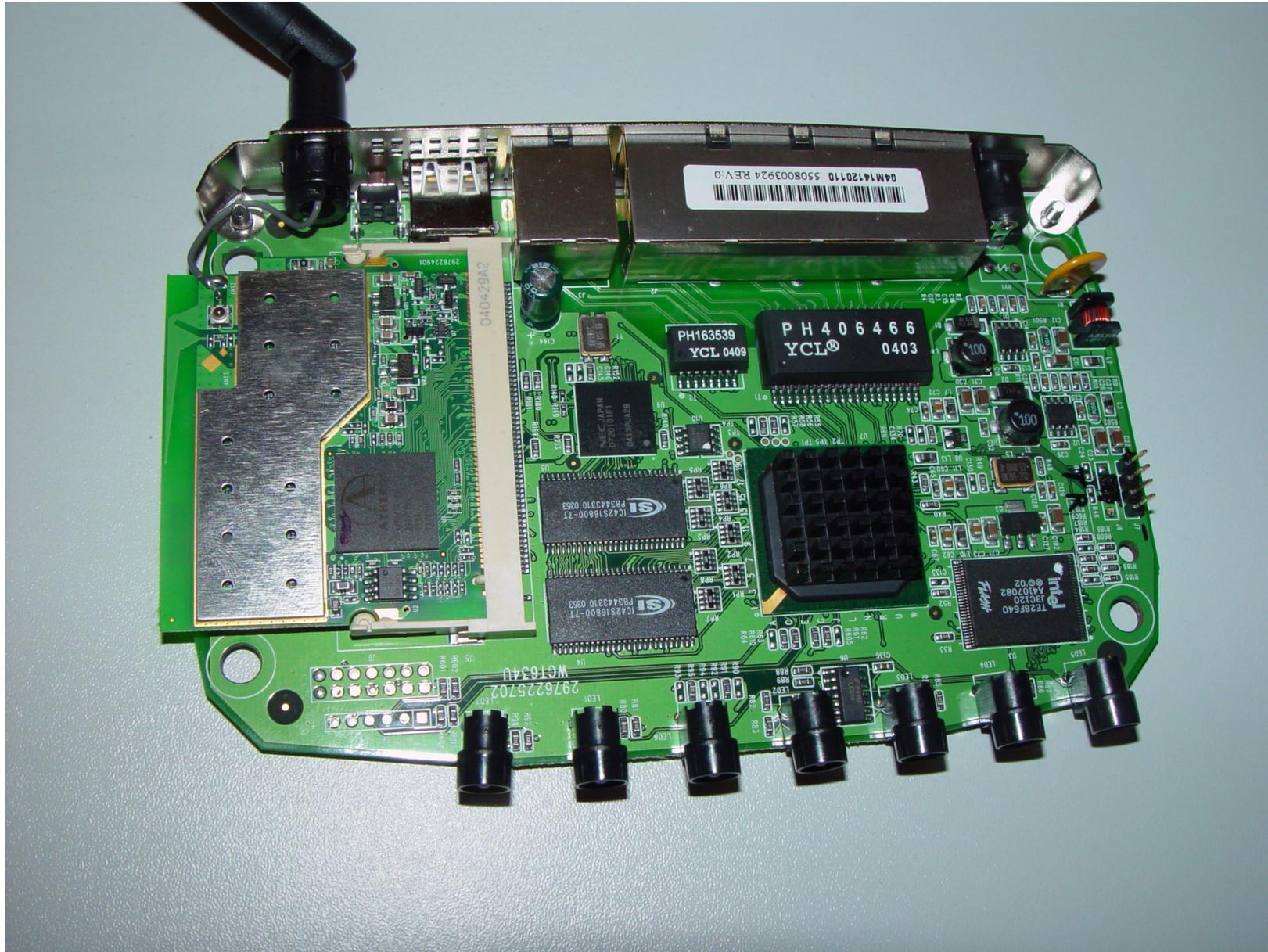
other manufacturer

D-Link
Netgear





Netgear



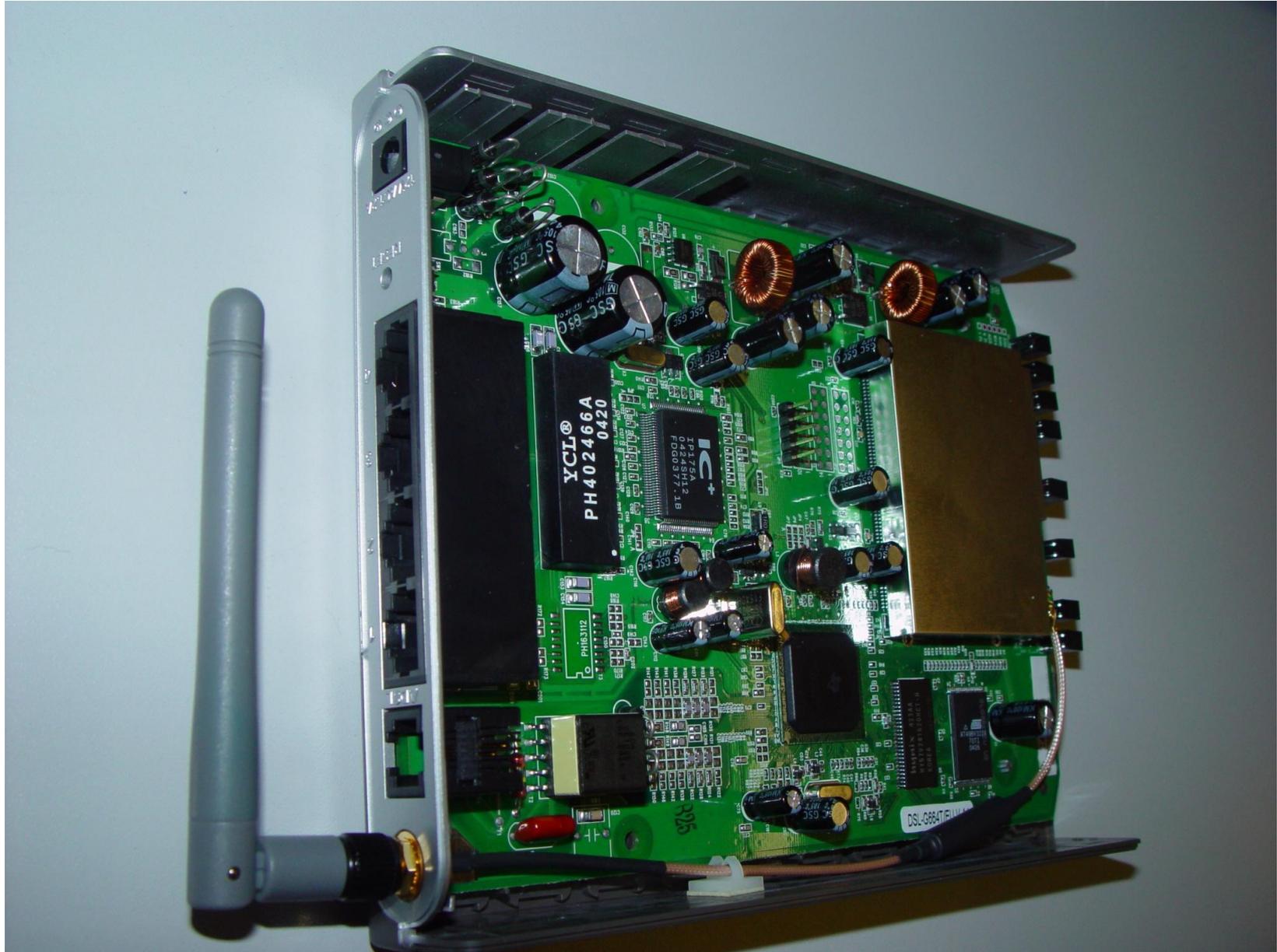


Netgear WGT634U

- Hardware
 - 200MHz MIPS Broadcom
 - RAM: 32MB
 - Flash: 8MB
 - USB2.0
 - 2*Serial and JTAG
- Software
 - Netgear Linux
 - <ftp://downloads.netgear.com/files/GPL/>
 - no other distribution yet
 - OpenWrt is in development



D-Link





D-Link

- Hardware
 - CPU 150MHz Mips Texas Instrument
 - RAM: 14MB
 - Flash: 4MB
 - Serial? JTAG?
- Software
 - D-Link-Linux
 - ftp://ftp.dlink.de/dsl-products/dsl-g664t/Treiber_Firmware/DSL-G664T.B01T16%20GPL%20release.tgz
 - no other Firmware, no development project known



other infos

- <http://www.gpl-violations.org/>
- **Linksys:**
 - <http://www.linksysinfo.org>
 - <http://www.linksys.com/support/gpl.asp>
 - <http://www.seattlewireless.net/index.cgi/LinksysWrt54g>
- <http://www.openwrt.org>