



## Benefits to the client

- Efficient usage of existing router hardware with support for additional functionality.
- New easy to use GUI
- New bandwidth usage monitor
- More advanced QOS and access restrictions
- Ability to enable new wireless features such as wireless distribution system (WDS) and wireless client modes
- Raise the limits on maximum connections for P2P, Telnet/ssh
- Run custom scripts
- See WiFi neighbors with wireless site survey
- Optimize transmit power
- Low cost home automation system



## Technology

- Tomato firmware
- Linksys WRT54G router
- Linux 2.4.20

Router is an integral part of a network and its security. Imagine if the same router, in addition, provides value added services for home automation!

Yes. Tomato firmware makes it possible!

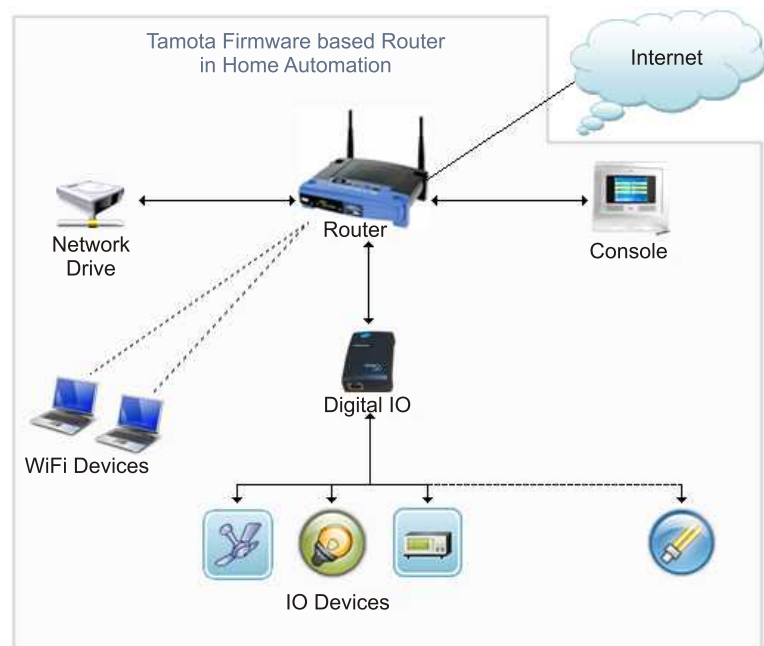
## Overview

Tomato is a small, lean and simple replacement firmware for wireless routers based on Broadcom processors. It provides an added feature set and is based on Linux, which makes it configurable.

Aftek has extensive expertise on Linux board support packages (BSP) and application development on various platforms. For one of our customers, we have ported Tomato firmware and a home automation application on a Linksys router. It enhances the basic feature set and capabilities of the router, thereby making it useful for home automation.

## Application

In the home automation system based on Tomato, Linksys router acts as a central unit. It controls and monitors user console, digital automation I/Os (to control home appliances like fan, lights etc.) and WiFi enabled devices which are connected as peripherals. The HTTP based user console, digital automation I/Os, WiFi devices and other peripherals form a local area network (LAN). The devices can access internet and are secured from external environment using firewall and enhanced security provided by Tomato firmware on the router. Rich console UI enables to configure parameters and monitor traffic across the router. File systems like JFFS and CIFS serve as a strong backbone for storage requirements.



## About Aftek

Aftek Limited is a full spectrum technology services company from India. Over last 20 years Aftek has gained significant exposure to variety of technologies. Rich technological capabilities, focused investments in Research & Development and industry exposure enables us to reach beyond the basic IT services to design and deliver projects, products and implement end-to-end solutions to customers in variety of industries. Our service spectrum covers key services as Hardware Development, Firmware Development, Embedded Systems, Application Development, Application Maintenance and Testing Services.

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- Linksys WRT54G version 2.0 router based on Broadcom BCM47xx, 200 MHz processor, 16 MB RAM, 4MB flash.
- Aftek ported and customized Tomato firmware with Linux 2.4.20 on Linksys router.
- Enabled functionalities like telnet, file systems (JFFS, CIFS), remote access for administration and startup scripts.
- Configurations done for NAT, port forwarding, QOS rules for inter device communication.
- Ported the home automation application (originally written for big-endian platform) on the little-endian platform using mipsel-uClibc toolchain.
- Developed audio driver to enhance audio interface performance with synchronized input output.
- Build automation.
- Developed GUI and communication application based on .Net framework 2.0.



## Conclusion

Tomato firmware is a platform having capability to convert your router into a super router. Usage in home automation is just one of the possibilities.