

There are two hardware versions of this router, the original 'v1', and the later 'B1'. Both have stable DD-WRT releases available.

By connecting a storage device, both can be fully self-contained; no more need for Internet access at bootup to load file system (FS) drivers. While this method requires some configuration (see [Mount FS by Direct Access Method](#)), third-party developers have now produced [firmware](#) (FW) images **with** the FS drivers, including swap. Similar official releases are thought to be forthcoming, but the timeframe is unknown.

For wireless-N with USB, this router remains one of the best values. Besides the standard network printer and storage tasks, it can run Asterisk (PBX), host separate wireless LANs (WLANs), run many of the hundreds of [Optware programs](#) including torrent clients such as Transmission, serve small websites, serve sound (Ex. to stereo) with inexpensive sound card attached, and it even scratches your back. (:^) These are covered in detail below. (Web cam on the horizon.)

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Overview Items

A Major Step Forward

From the earliest FW releases, FS drivers have been absent. While no extra storage is *required* to run DD-WRT (there's a robust feature set as-installed), it's a must for Optware and many device-hosted programs and USB-connected hardware.

To help us all, gouryella brought the needed FS modules together, wrote the scripts, hosted everything on his website, and even made a guide (see [here](#) or [in the thread](#)). (He's done similar for Optware, and his work is now also used in other routers.) Many thanks, gouryella.

With this method, the router downloads and installs the FS modules after each reboot; clearly some inherent shortcomings, but functional.

Now with the posting of [Kirill's wiki](#) (thanks to viking13 for bringing it to the forum), there is another option, one that allows **FS drivers** to be **loaded directly from an attached drive**. (See [below](#).) Faster and more consistent reboots are reported, and **dependence on web connection is eliminated**. Many thanks, Kirill.

But perhaps eclipsing this accomplishment, grymster has succeeded in building a DD-WRT from source. He has also been so kind as to post his tools so that others can create custom builds (see [Third-party Developer FW](#), below). Many thanks, grymster, and to amitg0123 also for the B1 build.

Differences in Hardware

The two versions differ primarily in the amount of flash memory and RAM onboard, the v1 at 4/32 and the B1 at 8/64 (MB flash/RAM).

There is also a small but significant difference in bootloaders which causes the two FW versions to be incompatible. Flashing the wrong one reportedly bricks the device. Take care when downloading!

Support Threads

Each hardware version has it's own support thread, the [v1 here](#) and [B1 here](#). Please post any comments to the pertinent thread, [the v1](#) as default.

Firmware Repository

Official releases are found [from here](#). After selecting folder year and release number, carefully choose either 'Asus-RTN13' for v1, or 'Asus-RTN13UB1' for B1.

Each directory contains two files, a .trx for [first flash](#) (from stock), and a .bin for [later updates](#).

Third-party Developer FW

For v1: grymster has created and posted on [this thread](#). (Earlier post with some ensuing discussion is [here](#)). grymster shares his tools for building the FW [here](#).

For B1: amitg0123 has started and posted on [this thread](#). (amitg0123 also started [a development thread](#) for information on building the FW.)

Notes:

- Must be logged in to see or download files.
- These are .trx files, which must be flashed using Asus Firmware Restoration Utility (AFRU).
- If DD-WRT is already installed, it is not possible to use the Firmware Upgrade tab under Administration in the web interface. (That input accepts only .bin files.) The router has to be placed in recovery mode, as for first flash (see [below](#)), and the .trx file uploaded using AFRU.

Which FW Image for Me?

The good news is, there are now options! Those wanting to stay strictly with official releases should pick from the links [here](#).

- To access USB-attached storage devices, router must be configured to load FS drivers, either by download on each restart, or by direct access to a prepared drive (see [Mount FS by Direct Access Method](#)).
- There is no swap, and no way to add it since it must be built into the kernel. And there is no indication that swap will ever be included in future official releases. (This is a consideration only if running memory-hungry programs (Ex. Transmission).

The more adventurous may consider [grymster's](#) or [amitg0123's](#) FW. Notes:

- Third-party so some (small) risk.
- FS drivers are built-in so no need for extra configuration work.
- Swap is included, available if needed.
- Current v1 build has some parts removed, notably support for IPv6, USB serial and printing, and 3G drivers for Sierra and Option cards.

Flashing from Stock Asus FW to DD-WRT

This procedure places the router in recovery mode, then uses AFRU to upload the DD-WRT (official or third-party) .trx file. Subsequent updates, if any, are much easier (see [Updating DD-WRT](#))

1. Preparation for Initial DD-WRT Install

1. Download desired DD-WRT FW file

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- ◇ Read the above and select file desired. Be absolutely sure it is right one, v1 vs B1.
- ◇ Be sure file is '.trx' (.bin files are for updates only, for use only after DD-WRT is installed).

2. Download latest version of the Asus Firmware Restoration Utility

- ◇ From a Windows machine, Browse to <http://support.asus.com/download>
- ◇ Navigate to device model number, -N13U or -N13U-B1
- ◇ Select OS
- ◇ Click '+' next to 'Utilities', select version and download
- ◇ Within the zip file, navigate to the */Utility folder and run 'setup' to install AFRU.
- ◇ Be sure AFRU can be started with no problems

3. Download safety copy of Asus firmware (optional)

- ◇ Do same as previous step, except click '+' next to 'Firmware' and download desired version.
- ◇ Note that this file should not be needed; use only to restore Asus FW to router if later desired.

4. Last few checks

- ◇ If not already directly wired, connect Ethernet cable from one of the router's LAN ports to client PC.
- ◇ Be sure router's other three LAN ports and WAN port are open (nothing connected)
- ◇ On PC, disable all other network adapters: wireless, modem, etc.
- ◇ On PC, disable any firewall (Ex. Windows Firewall)
- ◇ Optional: Set PC to use a static IP, Ex. 192.168.1.2, netmask 255.255.255.0, gateway 192.168.1.1
- ◇ If possible, use uninterruptible power supply (UPS) for both PC and router. A power failure while flashing, though not likely, will probably brick the router.
- ◇ Last check: Flashing a v1 FW to a B1 device will brick it, and vica versa. Be sure the FW file that is about to be flashed is the correct one for the device.

2. Flash to DD-WRT

1. Place router in Recovery mode

- ◇ Disconnect power adapter plug from router
- ◇ Push and hold the Restore button located on bottom panel. While continuing to hold down the Restore button, plug the power adapter back into router.
- ◇ After five seconds, LED on front panel starts to blink, release the button.

2. Upload firmware image

- ◇ On PC, open AFRU (installed earlier)
- ◇ In Firmware Restoration window, click 'Browse' and select the DD-WRT image file, asus-to-ddwrt.trx (downloaded earlier)
- ◇ Click 'Upload' to begin flash process that can take up to four minutes. Brick warning: Do not interrupt!
- ◇ When message that router is rebooting appears, close AFRU window.

3. Reboot, launch DD-WRT web interface, and cleanup

- After a minute or two, disconnect power adapter plug and leave for at least 10 seconds
- If optional step of setting static IP was followed earlier, can now reset to automatic
- Connect WAN port then reconnect power plug
- Browse to 192.168.1.1 should bring up the DD-WRT web interface; set name/password for first access
- Configure router as desired. Default connection is DHCP; for DSL check [DSL with DD-WRT](#).
- When satisfied that factory firmware will not be used again, uninstall Asus Utility from PC and delete Asus files.

Updating DD-WRT

This task is straightforward enough that it needs nearly no instruction.

1. Backup any scripts, files or settings that are intended for reuse.
2. Select and download the correct DD-WRT binary file, .bin, from [the repository](#) (see [Firmware Repository](#), above)
3. In the DD-WRT web interface, navigate to Administration | Firmware Upgrade tab, click 'Browse', select the downloaded .bin file, and click 'Restore'.
4. After restart, restore any backups as desired.

Mounting File System for External Storage

To access USB-attached storage devices, the router must be configured to load FS drivers, either by download on each restart (Download Method) or by direct access to a prepared drive (Direct Access Method). This does not apply to [third-party developer FW](#), which has the FS drivers built-in. If not using the router's file system or running Optware, this section can be skipped.

It is helpful to know that **Optware must be installed to an ext*-formatted (typically ext3) partition.**

Because one part of the drive must be ext*, the reasoning goes, it is most efficient to make it all the same, as each FS mounted consumes more RAM. (This is more of a concern in the v1 version, depending on what other loads are applied.) That noted, it is possible to mount multiple partitions by simply insmodding the corresponding modules (see step 9 under Direct Access Method).

Other considerations in planning **network storage strategy**:

- Transfer speeds through the router are limited to **2 - 2.5 MB/sec**. (This is a common limitation; not peculiar to this device.)
- Any drive with a USB interface can be attached to the router. Any active (powered) drive must have it's own power supply. (Flash drives are passive, not powered, so they can be plugged in directly.)
- Any drive attached to the router can be used for network storage by any and all clients on the LAN regardless of client OS (Windows, OSX, Android, etc.).

- Any (ext3-formatted) drive can be used for Optware installation. However, that drive must remain 'permanently' attached to the router.
- Multiple 'drives' can be attached by using a USB hub or combo card reader/USB hub. **Note:** Some report that in a multi-drive environment, drives will not auto-mount on router reset. (Each's USB plug must be manually re-inserted after a restart; then it can be mounted.)
- Flash drives should not be used for swap or they will quickly be ruined.
- Portable HDDs formatted ext3 for occasional attachment to the router can be used on Windows clients by installing either [explore2fs](#) or [linux-reader](#).

To do this setup, **access by terminal interface is needed**, either Telnet or SSH. If unfamiliar with these, see the [Telnet/SSH tutorial](#).

The Direct Access Method is preferred as it does not depend on an Internet connection, a distant server, and the presence and integrity of the driver file itself. The Download Method does have these dependencies, though it can be useful as a backup in (expectedly rare) situations (Ex. the local drive has failed or been removed). Normally either one method or the other is applied, then all forgotten about.

Mount FS by Direct Access Method

Overview

All official FW releases contain drivers for low-level access to USB storage devices. For direct access to work, the drive (typically SD card or flash drive) must be prepared with a special partition (typically small, 1~3 MB) in a memory-like format. (Note this does not convey any additional burden because this partition is never mounted.) The FS driver archive is then block-copied to it and the startup script modified to load the drivers automatically.

1. Have Disk On Hand

If already connected to router, power down both disk and router, wait a few seconds then disconnect disk.

2. Connect Disk to PC

- If disk is powered type, connect USB first, then power cable.
- If SD card or flash drive, just plug in.
- Caution: Never unplug a flash memory device without first unmounting or removing power from host.

3. Create Disk Backup

- If disk contains useful data, backup data before proceeding.

4. Choose a Format Method

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- Must have access to linux; 'dd' command is needed for block transfer.
- Windows users can run a live CD without altering host PC.
- Gparted is one of the most reliable; see [Gparted live CD](#).
- Gparted is also available on [Ubuntu live CD](#).
- May also refer to [Kirill's wiki](#) for using fdisk (linux) or [Format and Partition wiki](#).

5. Create (or Edit) Partitions

- Note: Existing ext* partitions (and a few other types) can be moved with no data loss (if sufficient space available) to make room for the tiny new one.
- Instructions for a typical installation, short version:
 - ◊ Make the first primary partition type ext3
 - ◊ Include all but the smallest partition size allowed (usually 1-3 MB) in the first primary partition
 - ◊ Make the second primary partition the remainder of the disk (usually the leftover 1-3 MB)
- Instructions under Windows, detailed version:
 1. Download the selected .iso image (Gparted or Ubuntu) from step 4. (The Gparted live CD actually loads Ubuntu, then calls Gparted on bootup.) Ubuntu 10.10 .iso is assumed.
 2. Burn the .iso to CD and reboot to that disk (In Windows, strike F8 during restart and select that option.)
 3. Tip: When asked about keyboard driver, accept the default option.
 4. In Gparted (in Ubuntu: System | Administration | Gparted Partition Editor), select connected USB device (Caution!), click Partition | Unmount, Partition | Delete, Edit | Apply All Operations (or green checkmark), Device | Create Partition Table | Apply, and click on new, unallocated partition table to select.
 5. Continuing, click Partition | New, then for 'File System' pick ext3. Click the down arrow next to 'New Size (MiB)' one time. (This will leave space for the smallest allowable partition for direct access.) Click 'Add'.
 6. In table, click to select unallocated 1.00 MiB partition, Partition | New, then for 'File System' select 'unformatted', Add.
 7. Table should display only the two newly-created partitions and none unallocated. Click Edit | Apply All Operations (or green checkmark), Apply.
 8. When done, view as-written partition table; exit Gparted.
 9. Open command shell window, Applications | Accessories | Terminal
 10. If drive was unmounted earlier, unplug USB connection. (If any doubt, shutdown PC, then unplug.)

Tip: If running Ubuntu live CD, before removing, partition one of PC's disks, install and try out. Many consider Ubuntu superior to Windows.

6. Preformat Direct Access Partition

- Re-connect USB drive to PC
- In linux terminal, verify drive is mounted:

```
df -h  
mount
```

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The last line of output of each of these commands should contain the reference to the first partition.
Ex:

```
/dev/sdb1          241M  6.1M  222M   3% /media/b564adc7-53c4-482d-a296-8391af52fe3b
/dev/sdb1 on /media/b564adc7-53c4-482d-a296-8391af52fe3b type ext3 (rw,nosuid,nodev,uhelper=udisks)
```

Note name is /dev/sdb1; format is ext3. Second partition (the unformatted one) is then /dev/sdb2 (not shown).

If any doubt, check and be sure. All data will be eliminated from /dev/sdb2 (in this example).

- Preformat the small partition:

```
sudo dd if=/dev/zero of=/dev/sdb2
```

7. Download FS Driver File

- Still in linux terminal, copy mount point from earlier output and paste with cd command, followed by download of driver file:

```
cd /media/b564adc7-53c4-482d-a296-8391af52fe3b
sudo wget http://home.karneval.cz/10102207/fs.gz
```

This places a copy of the driver file temporarily in the first partition. Block transfer it now to the second for direct access:

```
sudo dd if=fs.gz of=/dev/sdb2
```

8. Prepare Optware Partition and Unmount

Skip this step if only modifying an existing drive for direct access and with Optware already installed. (Unmount only.)

- Note that Optware will not install unless partition is completely empty. Still in Linux terminal:

```
sudo rm fs.gz
sudo rmdir lost+found
```

- Drive is now ready to receive Optware. Unmount before disconnecting USB:

```
umount /dev/sdb1
```

Done with linux terminal.

9. Update Settings in Web Interface

- Login to router (from browser) and navigate to Services | USB tab. Enable each of the following:

- ◇ Core USB Support
- ◇ USB 2.0 Support
- ◇ USB Storage Support

◇ Automatic Drive Mount

Click 'Apply Settings'

- Plug pre-formatted USB drive into router
- Head to Administration | Commands tab and paste in window:

```
sleep 15
cd /tmp/var/tmp
tar -zxvf /dev/scsi/host0/bus0/target0/lun0/part2
insmod jbd.ko
insmod mbcache.ko
insmod ext3.ko
rm /tmp/var/tmp/*.ko
sleep 10
mount -t ext3 -o noatime,nodiratime /dev/scsi/host0/bus0/target0/lun0/part1 /opt
```

Click 'Save Startup'. This should work as written if partitioned per examples and only one disk; skip to 10.

- Other cases

◇ If other drives are attached or there are extra partitions on the drive, '/dev/scsi/host0/bus0/target0/lun0/partX' may not work. In this case, determine correct partition string(s) and replace in the above (both 'tar' and 'mount' lines). Hint: Attach drives one-at-a-time while monitoring the output of:

dmesg

(which can be entered at command line or in same Commands window (Administration | Commands tab), except pressing 'Run Commands' button).

◇ For each additional file system needed, append insmod lines (just above 'rm' line) as required:

- For FAT/FAT32
 - ◇ fat.ko
 - ◇ vfat.ko
 - ◇ nls_iso8859-1.ko
 - ◇ nls_cp437.ko
- For NTFS
 - ◇ fuse.ko

◇ Also append similar 'mount' lines, but with 'ext3' replaced by file type, 'vfat' or 'ntfs-3g'.

◇ Of course, if ext3 format is not used, delete those three 'insmod' lines (jbd.ko, mbcache.ko, and ext3.ko).

◇ In general, if the modules are inserted then the drive plugged in, the drive should be recognized and its device string should appear in *dmesg* output.

10. Reboot and Check

- Reboot router, soft (Administration | Management tab, Reboot Router button) or hard (pull power adapter plug, wait at least 10 seconds, plug back in).
- Verify drive mounting:

◇ At command line or in Commands window (Administration | Commands tab), enter:

mount

(and hit 'Run Commands' button). Drive should show up on /opt, Ex:

```
/dev/scsi/host0/bus0/target0/lun0/part1
          3.6G      419.8M      3.0G  12% /opt
```

- Now ready to install Optware.

Mount FS by Download Method

The next subheading describes the download method, but remains under its original title, "Automounting ext3/FAT/FAT32/NTFS" to keep from breaking any links to it.

If Direct Access method was applied, jump to [Installing Optware Light](#).

Automounting ext3/FAT/FAT32/NTFS

The following tutorial is from [gouryella's guide](#), which will always have the most up-to-date information. (It is linked from the [Supported Devices Page](#).)

The RT-N13U has only 4 MB flash, which is almost full with DD-WRT installed. Ext3 needs an extra 200 KB of storage, and the driver is not present in the DD-WRT firmware yet [BrS]. Gouryella wrote a smart script that downloads the ext3 driver and mounts the 1st partition to /opt during boot (after WAN is up)

1. Just paste the following into the text box in Administration -> Commands and click Save Startup

[NOTE: configuration of filesystem support and partitions can be easy set at first line, NTFS needs additional driver, that can be installed after you pass Optware guide by **ipkg install ntfs-3g**]

```
EXT3="YES"; EXT3P="part1"; NTFS="NO"; NTFSP="part2"; FAT="NO"; FATP="part3"; mkdir /tmp/etc/config
echo "wget http://home.karneval.cz/10102207/fs.gz -P /tmp/root" >> /tmp/etc/config/fs.wanup
echo "tar -xvzf /tmp/root/fs.gz -C /tmp/root" >> /tmp/etc/config/fs.wanup
if [ "$EXT3" == "YES" ]; then echo "sh /tmp/root/ext3" >> /tmp/etc/config/fs.wanup; fi
if [ "$NTFS" == "YES" ]; then echo "insmod /tmp/root/fuse.ko" >> /tmp/etc/config/fs.wanup; fi
if [ "$FAT" == "YES" ]; then echo "sh /tmp/root/fat" >> /tmp/etc/config/fs.wanup; fi
echo "mount /dev/discs/disc0/$EXT3P -o noatime,nodiratime /opt" >> /tmp/etc/config/fs.wanup
echo "/opt/bin/ntfs-3g /dev/discs/disc0/$NTFSP /mnt" >> /tmp/etc/config/fs.wanup
echo "mount /dev/discs/disc0/$FATP /jffs" >> /tmp/etc/config/fs.wanup
echo "rm /tmp/root/*.ko /tmp/root/fs.gz /tmp/root/ext3 /tmp/root/fat" >> /tmp/etc/config/fs.wanup
chmod +x /tmp/etc/config/fs.wanup
echo "nobody:*:65000:65000:nobody:/mnt:/bin/false" >> /etc/passwd
```

1.1 Enable the following under Services -> USB

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Core USB Support
USB 2.0 Support
USB Storage Support
Automatic Drive Mount

1.2. Reboot router with an ext3 formatted USB drive plugged in

If the drive was successfully mounted (which may take some time), try another filesystems by editing 1st line of script.

[NOTE: check mounts thru putty by DF -h because in dd-wrt gui is shown only after replugging drive]

1.3 Debugging:

```
#delete or sharp 10th line, reboot again and check:
dmesg
lsmod
ls /tmp/root
cat /tmp/etc/config/fs.wanup
ls /tmp/etc/config/
```

Installing Optware Light

This tutorial is also from [gouryella's guide](#) (see steps 4 - 6).

1. Installing Optware (only to an ext3 partition; /opt MUST be empty)

```
wget http://home.karneval.cz/10102207/optware-install.sh -O - | tr -d '\r' > /tmp/optware-install
sh /tmp/optware-install.sh; ipkg update; ipkg upgrade
wget http://home.karneval.cz/10102207/sort -P /opt/bin; chmod +x /opt/bin/sort
```

[NOTE: gateway is hard set to 192.168.1.1, if u have problem with this replace in optware-install.sh by vi or sed]

Now you can install another Optware packabe from

<http://www.dd-wrt.com/http://wiki.dd-wrt.com/wiki/index.php/Tutorials> or if u like:

1.1. Install xinetd, vsftpd, samba, webserver, pxe boot server, wget, nano, htop, dlq rapget

```
ipkg install xinetd htop nano samba2 vsftpd tftp-hpa wget; killall xinetd smbd nmbd
rm /opt/etc/samba/smb.conf /opt/etc/vsftpd.conf /opt/etc/init.d/S80samba /opt/etc/xinetd.d/tftp
wget http://home.karneval.cz/10102207/opt.gz -P /opt; tar -xvzf /opt/opt.gz -C /opt
sh /opt/etc/init.d/S10httpd; sh /opt/etc/init.d/S10xinetd; rm /opt/opt.gz
```

1.2 Well done, RT-N13u is ready for basic usage, u can acces by

```
samba: \\192.168.1.1
rem to add as harddrive in W7/XP run in command line
net use a: \\192.168.1.1\www
net use b: \\192.168.1.1\dlq
web: http://192.168.1.1:8080
ftp: ftp://192.168.1.1
pxe: add: dhcp-boot=pxelinux.0,dd-wrt,192.168.1.1 to Services -> Services -> Additional DNSMasq O
```

1.3 Open to the world (paste to Administrations -> Commands and Save Firewall)

```
iptables -t nat -I PREROUTING -p tcp -d $(nvram get wan_ipaddr) --dport 80 -j DNAT --to 192.168.1.1
iptables -t nat -I PREROUTING -p tcp -d $(nvram get wan_ipaddr) --dport 22 -j DNAT --to 192.168.1.1
iptables -t nat -I PREROUTING -p tcp -d $(nvram get wan_ipaddr) --dport 21 -j DNAT --to 192.168.1.1
iptables -I INPUT -p tcp -d 192.168.1.1 --dport 8080 -j logaccept
iptables -I INPUT -p tcp -d 192.168.1.1 --dport 22 -j logaccept
iptables -I INPUT -p tcp -d 192.168.1.1 --dport 21 -j logaccept
```

Installing a Transmission-daemon onto Asus RT-N13U

See [Installing a Transmission-daemon onto Asus RT-N13U](#) on page 2.

Installing a Network Printer onto Asus RT-N13U

See [Installing a Network Printer onto Asus RT-N13U](#) on page 2.

Fire up a Second Wireless Network w/ Optional Bandwidth Throttling

See [Fire up a Second Wireless Network w/ Optional Bandwidth Throttling](#) on page 2.

Sound Card

See [Sound Card](#) on page 2.

DLNA/UPnP Media Servers

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Device Specifications

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