Running Debian on Inexpensive Network Attached Storage Devices

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This is my personal opinion; no recommendation implied

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Network Attached Storage devices

- For most people, a Network Attached Storage device (NAS) is an external hard drive on steroids
- For geeks, a NAS is a complete computer

Advantages of NAS

- Power efficient
- Quiet
- Cheap

- Makes a nice home server

Linksys NSLU2, aka Slug

- Intel IXP42x, 133 or 266 MHz
- 32 MB RAM
- 8 MB flash
- no internal disk
- 1 10/100 Ethernet
- 2 USB

Linksys NSLU2

Advantages:

- It's cheap
- It's quiet (no fan)
- Firmware can be upgraded via the network
- It can run on flash only

Disadvantages:

- Ethernet needs proprietary microcode
- It's slooow and doesn't have much memory

Linksys NSLU2

- Feature complete, maintenance mode
- Packages nslu2-utils and ixp4xx-microcode
- Support for LEDs, beeper, Ethernet
- Ethernet driver: Krzysztof Halasa
- Some new ideas about improving d-i support (example: mounting ext3 as ext2)
- Gordon Farquharson, Joey Hess, NSLU2-Linux team

Thecus N2100

- Intel IOP 80219, 600 MHz
- 1 DDR400 slot (up to 512 MB)
- 16 MB flash
- 2 SATA
- 2 GBit Ethernet
- 3 USB
- 1 mini-PCI slot

Thecus N2100

Advantages:

- It's reasonably fast
- RAM can be upgraded
- Two Ethernet ports
- The company supports our porting effort

Disadvantages:

- Ventilation is not ideal
- It's noisy
- It's expensive
- CPU and device are EOL

Thecus N2100

- Works pretty well, some remaining issues
- Most new Debian build machines are N2100
- Support for fan controller
- Support for LEDs and beeper
- Network bug (with multicast packets)
- No DMA support (slow disk performance)
- Lennert Buytenhek, Riku Voipio, Dan Williams

Orion

- Made by Marvell
- System on a Chip (SoC)
- ARM compatible
- 400-500 MHz CPU
- Ethernet (mv643xx_eth), SATA (sata_mv), USB
- DMA engine
- Crypto engine (some)

Orion

- Marvell works with the community
- Hired Lennert Buytenhek and Nicolas Pitre
- 2.6.25: support for Orion, Ethernet and SATA
- Later: support for DMA and crypto engine
- Public documentation available

Orion


HP Media Vault Pro
mv5100 Series
玄人志向
POWER
LINK/ACT
INFO
ERROR
玄箱
KURO BOX
COPY
STATUS
QNAP
QNAP

QNAP Turbostation TS-109, TS-209 and TS-409

- Orion 500 MHz
- 128, 256 or 512 MB RAM
- 8 MB flash
- 1 internal, 1 external (TS-109), 2 internal (TS-209) or 4 internal (TS-409/TS-409U) disks
- 1 GBit Ethernet
- 3 USB

QNAP Turbostation TS-109, TS-209 and TS-409

Advantages:

- Casing (chassis) very robust
- Quiet (TS-109: no fan; TS-209: quiet fan)
- The company supports our porting effort
- Supports 1, 2 and 4 hard drives
- Offers recovery mechanism

Disadvantages:

- Expensive

HP Media Vault mv2100

- Orion 500 MHz
- 128 MB RAM
- 512 KB flash (boots from disk)
- 2 internal disks
- 1 GBit Ethernet
- 2 USB

HP Media Vault mv2100

Advantages:

- Quiet
- The company supports our porting effort
- Recovery mechanism via TFTP

Disadvantages:

- Not available everywhere (Europe: mv5020)
- No fan regulation (hardware)

Kurobox Pro

- Orion 400 MHz
- 128 MB RAM
- 256 MB flash
- 1 internal disk
- 1 GBit Ethernet
- 2 USB
- Exports I2C and GPIO
- PCI Express 1x
- Similar to the Buffalo Linkstation
- Support was added by Per Andersson

Kurobox Pro

Advantages:

- Hacker friendly (exports I2C and GPIO; but no serial)

Disadvantages:

- Hard to find in Europe (Kurobox)

Other Orion devices

- Conceptronic CH3SNAS (Grab'n'GO Media Store)
- D-Link DNS323
- Buffalo Linkstation Pro/Live, Duo and Tera
- Iomega StorCenter
- LaCie Ethernet Disk mini V2
- Maxtor Shared Storage (MSS) II
- Synology Disk Station DS-107+
- ... and many more

The future

- Persistent disk naming with udev
- Put a rescue filesystem in flash
- Put a SSH server in the ramdisk
- Support installations to MTD flash
- Port Debian to more devices
  - Freescale i.MX515
  - Marvell Kirkwood
  - TI OMAP (Gumstix and Beagleboard)
  - Non-ARM devices

More information

- Linksys NSLU2
  - `http://www.cyrius.com/debian/nslu2/`
  - `http://www.nslu2-linux.org/`
- Thecus N2100
  - `http://www.cyrius.com/debian/iop/n2100/`
- Orion
  - `http://www.cyrius.com/debian/orion/`