

Big on Storage

THE BEST TWO-BAY CONSUMER NETWORK

TEXT // DAVID CHIENG

STORAGE SOLUTIONS FOR YOUR MONEY.

ART DIRECTION // TAN LIYONG + LIM WEI ZHEN PHOTOGRAPHY // ELLEN LIM

For the geek with loads of videos, digital photographs and other data, getting down and dirty with an NAS (Network Attached Storage) box can be a very convenient way to keep all that digital clutter in one organized space. Whether streaming music to your networked music player, or high-definition movies and videos to your brand new Full HD flat screen, or even for hosting a simple home-based web server, these two-bay NAS devices compared this month are aimed at pleasing both your pocket and your inner geek.



Features
and Design

▶▶▶ BUFFALO LINKSTATION PRO DUO LS-WVL

Buffalo's LinkStation Pro Duo LS-WVL is actually one of the more compact NAS boxes of the lot. Access to the pair of drives is as easy as removing the front cover, while the drives themselves are attached to racks that slide in and out of the main chassis. The front fascia is a little basic though, sporting just three LEDs; one for power, the second as the Function LED which blinks for direct copy, initialization and USB dismounting, while the third simply blinks red when an error occurs. The function LED is put into play when using the function button placed at the rear, though we think that front placement would have made more sense in terms of accessibility. Interestingly, the LS-WVL can be set to turn on and off automatically with your PC too. And like the D-Link DNS-320, the LS-WVL also features just one USB2.0 port.

CPU 1.6GHz Marvell 88F6282	HDD TRAYS 2x 3.5"	LAN 1x Gigabit
MEMORY 256MB DDR3	PORTS 1x USB2.0	PRICE \$329



Internally, you get a 1.6GHz Marvell processor and 256MB of DDR3 memory.

A function switch is used to initialize the LinkStation, as well as initiate direct copy and dismount USB devices.

NOT JUST BOXES THAT HOLD ALL YOUR DATA, THESE NAS SOLUTIONS COME WITH MORE FUNCTIONALITY AND FEATURES WORTH CONSIDERING.

▶▶▶ NETGEAR READYNAS ULTRA 2 RNDU2000

If its features that you want, Netgear has you covered with the ReadyNAS Ultra 2. Being the only NAS in the roundup to feature an Intel Atom processor running at 1.8GHz (albeit just a single-core D410 chip), it's also got 1GB of DDR3 memory. The hard drive bays are hot-swappable, with the drives also lockable for added security behind a movable door. You also get a pair of Gigabit Ethernet ports at the rear, though no teaming or failover functionality is present. In a nod to the latest in data transfer technologies, the ReadyNAS Ultra 2 also comes with a single USB3.0 port up front, as well as a pair of USB2.0 ports at the rear. Physically, you get a gun-metal grey chassis that is as solid as it looks. If anything, this NAS is built like a tank. All this does come at a price, as the ReadyNAS Ultra 2 is the most expensive NAS box of the bunch, at a whopping \$880 minus hard drives.

CPU 1.8GHz Intel Atom D410 Single Core	HDD TRAYS 2x 3.5" (Hot-swappable)	LAN 2x Gigabit (no teaming/ failover)
MEMORY 1GB DDR3	PORTS 1x USB3.0 (front), 2x USB2.0 (back)	PRICE \$880



The hard disk drives are screwed onto racks, which are then inserted into the ReadyNAS Ultra 2.

The business end of this NAS features a large ventilation fan, which pushes air through the box.

▶▶▶ D-LINK DNS-320 SHARECENTER PULSE

D-Link's DNS-320 is the long-awaited replacement model of the hugely popular DNS-323 from some years back. Physically, D-Link chose to go with loads of shiny plastic all around, which does add to visual appeal, but also that the NAS box itself is a humongous dust-magnet. Up front you can see a single USB port, as well as the one-touch backup and power buttons. Unlike the other NAS solutions compared here, your hard disk drives are installed in a vertical fashion on the DNS-320 after removing a plastic cover up on top, much like how you would insert slices of bread into a toaster. Furthermore, the bare drives are installed just like that, with no screws or drive rails to speak of. Nevertheless, for ease in setting up, this one gets top marks. It's also important to note that the DNS-320 is the cheapest NAS box in the comparison, at just \$199 minus hard drives.

CPU 800MHz Marvell 88F6281	HDD TRAYS 2x 3.5"	LAN 1x Gigabit
MEMORY 128MB	PORTS 1x USB2.0	PRICE \$199



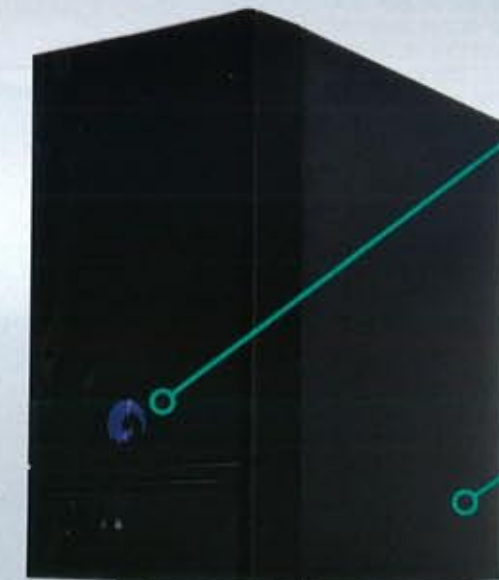
Installing the hard drives is as easy as dropping them in; no tools required whatsoever.

An 800MHz Marvell processor and 128MB of RAM help power data through the Gigabit Ethernet port.

▶▶▶ SEAGATE BLACKARMOR NAS 220

Despite being a regular name in the storage industry, it's taken Seagate quite a while to broach the consumer NAS space. Their BlackArmor NAS line starts with the 220, which as the model number indicates, is of the 2-bay variety. The 220 is also the only entry in the comparison to come pre-installed with hard disk drives, with capacities starting from 2TB, all the way up to 6TB (using a pair of Seagate's latest 3TB drives, of course), priced at a staggering \$1,069. The drives are still user-serviceable though, so long as you have a screwdriver handy. Setting up is exceedingly simple thanks to a discovery software utility, even assisting with mapping network drives straightaway. The front end of the 220 has three status LEDs, while the rear end is where the Gigabit Ethernet port and two USB2.0 ports are for extra storage and printers to hook up to.

CPU 800MHz Marvell 88F6192	HDD TRAYS 2x 3.5" (User-serviceable)	LAN 1x Gigabit
MEMORY 128MB DDR2	PORTS 2x USB2.0	PRICE From \$469 (2TB) to \$1,069 (6TB)



The LEDs show the status of the internal hard drive, the status of the entire system.

Once the power and Ethernet cables are connected, power up and go through the user-friendly setup software.

Features
and Design

SYNOLOGY DS211

One of Synology's latest NAS products announced, the DS211 is a compact little box powered by a 1.6GHz Marvell Kirkwood processor and 256MB of RAM. Slightly down the performance chain, Synology also offers the DS211j, with a slower 1.2GHz processor and just 128MB of RAM. Looks-wise, the DS211 isn't pretty by any means, as Synology chose to outfit it with a white exterior. It'll certainly stick out like a sore thumb on your shelf of networking gear. Unlike some of the other entries in this shootout, the DS211's dual hard drive bays aren't easily accessible, requiring you to crack open the casing to add and/or remove drives. A set of LEDs up front indicate the status of the NAS, the internal hard drives and the network connection, while three USB2.0 ports (one up front and a pair at the rear) complement the single Gigabit Ethernet jack.

CPU 1.6GHz Marvell 88F6282	HDD TRAYS 2x 3.5"	LAN 1x Gigabit
MEMORY 256MB	PORTS 3x USB2.0	PRICE \$490



Maintenance also requires cracking the casing open.

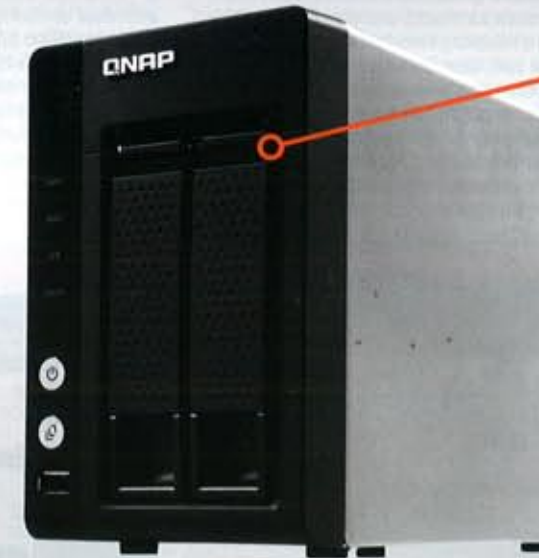


A single Gigabit Ethernet jack takes care of network connectivity.

QNAP TS-219P+

The final entry in this NAS roundup is QNAP's TS-219P+, featuring the same processor as found on the Synology DS211, but double the memory at 512MB. QNAP also takes connectivity up a notch with a pair of eSATA ports at the rear for storage expansion, as well as a grand total of three USB2.0 ports. The two drive bays are hot-swappable by design, allowing users to swap out defective drives at a moment's notice without having to power down. The latched rack design also means installing hard drives is made very easy. In terms of design, QNAP goes for solid black all around, giving the TS-219P+ a serious but stylish look that could fit into the office just as well as at home. Part of QNAP's recent x19P+ line refresh, the TS-219P+ also runs their new V3.3 software. Nevertheless, at \$667, the TS-219P+ is still a tad pricey.

CPU 1.6GHz Marvell 88F6282	PORTS 1x USB2.0 (front), 2x USB2.0 (back), 2x eSATA (Back)	LAN 1x Gigabit
MEMORY 512MB DDR3	HDD TRAYS 2x 3.5" (Hot- swappable)	PRICE \$ 667



Hot-swap ability lets you swap out drives without having to turn off the NAS.

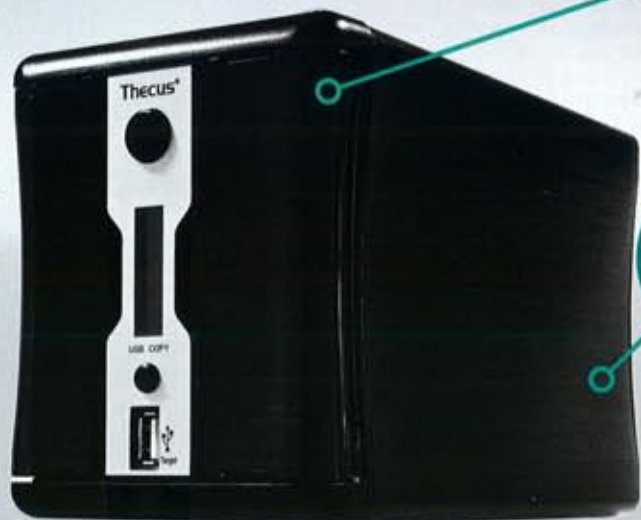


A pair of eSATA ports let you easily add on additional external storage.

THECUS N2200+

Eagle-eyed readers will no doubt notice that the Thecus N2200+ looks familiar. The N2200+ is an updated revision of the 'older' N2200 reviewed in HWM January 2011. The upgrades include a much faster 600MHz processor that's also dual-core, and 64MB of internal flash memory versus 4MB on the older N2200. The N2200+ also sports a pair of Gigabit Ethernet ports (versus just one on the N2200), though just a pair of USB2.0 ports (versus four on the N2200). RAM-wise, Thecus sticks with 256MB, which isn't too surprising given the asking price. Elsewhere physically, there's not much difference; the drive bays aren't lockable, and are covered by a pair of plastic flaps. If you're hunting for a NAS that also looks good, Thecus falls short in this area thanks to an aesthetic we can only describe as "thoroughly geeky".

CPU Cavium ECONA CNS3420 SOC 600MHz (Dual-Core)	HDD TRAYS 2x 3.5" (Hot- swappable)	LAN 2x Gigabit (no teaming/ failover)
MEMORY 256MB DDR2	PORTS 1x USB2.0 (Front), 1x USB2.0 (Back)	PRICE \$259



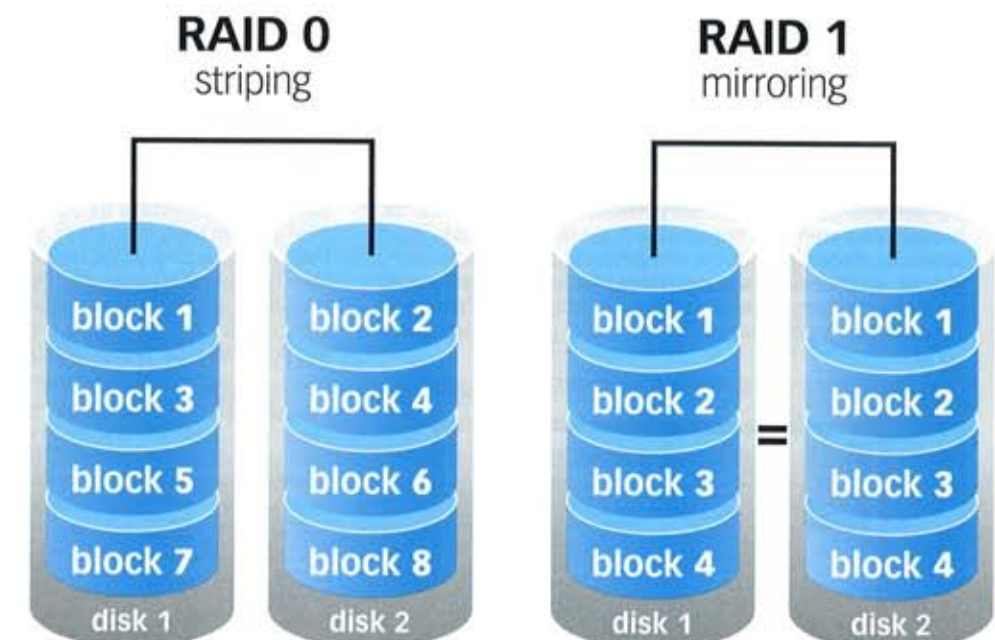
The drives are mounted to racks, which then latch into place in their individual slots.



A pair of Gigabit Ethernet ports adorn the rear end of the N2200+, as well as one of two USB2.0 ports.

Choosing
Between
RAID 0 and
RAID 1

By definition, a RAID 0 volume splits data evenly across two or more disks, with no parity information for redundancy. RAID 1 on the other hand creates an exact copy of data on two or more disks. In the case of the two-bay NAS boxes compared this month, we recommend that going with RAID 1 be your default plan of action, with the exception being the Netgear ReadyNAS Ultra 2, as X-Raid2 goes for redundancy by default. Given that hard disk drives are cheaper than ever, with 2TB drives going for under \$150, there's no reason why one can't afford to splash out on a pair for redundancy, and yet still have loads of space left over to store all your movies, digital photos and backups. There's not much of a performance difference either, so unless you really couldn't care less about the data stored on your NAS, going RAID 1 could save you a great deal of trouble.



NETWORK
STORAGE
SHOOTOUTSoftware and
AdministrationBUFFALO LINKSTATION
PRO DUO LS-WVL

Buffalo's NASNavigator2 software gives users a bird's-eye view of key pieces of information such as IP address, storage capacity remaining as well as firmware revision. Very handy also is the ability to map folders on your NAS directly to your computer via NASNavigator2. Like all the other NAS boxes here, administering to the LinkStation is done mostly through a web interface. Standard features include web and media servers, BitTorrent download scheduler and even Time Machine support for Mac users. Buffalo's web interface is a little simple and utilitarian, with very little fluff and polish in terms of design, though sluggish at times.

NETGEAR READYNAS
ULTRA 2 RNDU2000

Unless you've got the specific IP address of your NAS committed to memory at all times, having apps like Netgear's RAIDar hanging around comes in handy when quickly checking out the status of the ReadyNAS Ultra 2. What we particularly liked was the ability to see essential information such as hard disk health, temperature and even the status of the cooling fan on the NAS. Logging into the web interface, users can opt to run in Wizard mode (ideal for newbies who aren't too bothered with the nitty gritty just yet), or Advanced mode where all the various options and features are laid out. Just like every NAS available today, web, FTP and media server functionality come standard issue. Netgear also throws in Time Machine backup capability for those of you running Macs at home.

D-LINK DNS-320
SHARECENTER PULSE

D-Link's DNS-320 boasts a simple administration web interface with four sections: Setup, Advanced, Maintenance, Status and Support. Menu options are laid out neatly, though it would be even better if D-Link had put in some descriptions for the less technologically savvy. In a nod to the newbies, D-Link also builds in a wizard interface that lets novice users get up to speed with a minimum of fuss; though we'd still recommend that first-time users give the quick-start guide a thorough read. The interface was also reasonably responsive when going through the various settings for the FTP, Web, Photo and download servers.

SEAGATE BLACKARMOR
NAS 220

Seagate's BlackArmor NAS 220 is administered via a built-in web server, which also lets you create users, groups and folders with relative ease. While there are two hard drives pre-installed, RAID 1 is the default here. To safeguard against drive failures, SMART functionality diagnoses and detects potential hard drive failures so you can quickly backup your data elsewhere prior. In a nod towards added security for those looking to access the NAS 220 from a locale away from home, you can generate an SSL certificate that enables access to the NAS via the HTTPS protocol. And if you have the right UPS hardware, the NAS 220 can also automatically shut down in case of power failure. Backups are also made easy with the NAS 220, as Seagate provides a software client that lets you do so once the proper backup schedules are set.



HERE'S A LOOK AT THE ADMINISTRATION INTERFACE OF EACH NAS BOX COMPARED, FOCUSING ON EASE OF USE AND USER-FRIENDLINESS.

SYNOLOGY DS211

We're longtime fans of Synology's DiskStation Manager software, now into revision 3.0. Synology regularly updates the operating system to add new features and fix any bugs found, and upgrading to the latest revision is as simple as reinstalling the software using the updated code. While the web interfaces on the other NAS boxes typically involve refreshing the page with every new click to a different section, DSM3.0 is designed to multitask, letting you access multiple application pages at one go. DSM3.0 also enables a variety of features including video surveillance, file sharing, DLNA media server and more. Power-saving functions are also present, including the ability to hibernate both internal and external drives after a preset time. And in the case of the DS211, you also get Wake-on-LAN (WoL) and Power Schedule On/Off capabilities.



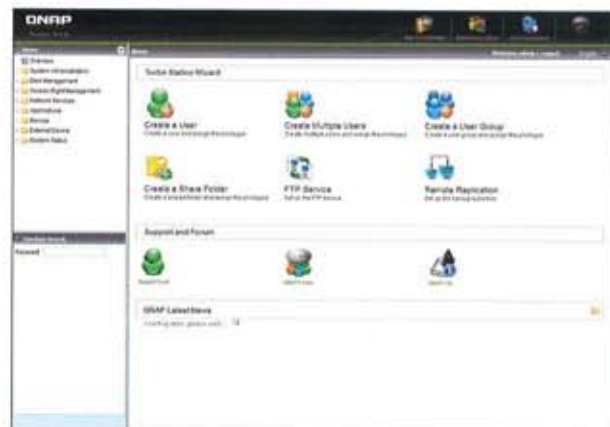
THECUS N2200+

Unfortunately for Thcus, their web administration software needs a great deal more work to be able to properly compete with the other NAS boxes compared this month, mainly because the interface was comparatively sluggish. Despite being powered by AJAX, the interface paused each and every time a new page was loaded. On the other hand, in terms of features, Thcus builds a commendable amount of functionality into their web interface with settings for everything from system management to storage as well as user and group authentication. Users can even add extra functionality by installing add-on modules; for example, the Transmission client that handles BitTorrent downloads. For iPhone users, there's also the Thcus Dashboard, a free app that lets users remotely monitor and manage a Thcus NAS.



QNAP TS-219P+

Announced back in July last year, QNAP's Turbo NAS V3.3 firmware was a literal breath of fresh air for the NAS maker, thanks to a total makeover powered by AJAX. The new interface is refreshingly snappy, and although there is a lot of information to absorb at first glance, there are just enough novice-friendly touches such as feature and function explanations to help smooth the way. Everything from system and network rights management can be tweaked, while links to downloads and multimedia management are each prominently displayed for easy access. Overall, top marks for a user interface that's actually both user-friendly and pleasing to the eyes. QNAP also includes an application called QMobile, which lets users with iPhone, iPod touch and iPad devices browse and play (or even download for offline enjoyment) multimedia files stored on the NAS. Users can also use QMobile to upload photos to the NAS and publish them to the web.



TESTING WAS DONE WITH INTEL'S NAS PERFORMANCE TOOLKIT, ON HD VIDEO PLAYBACK, OFFICE PRODUCTIVITY, CONTENT CREATION AND MORE.

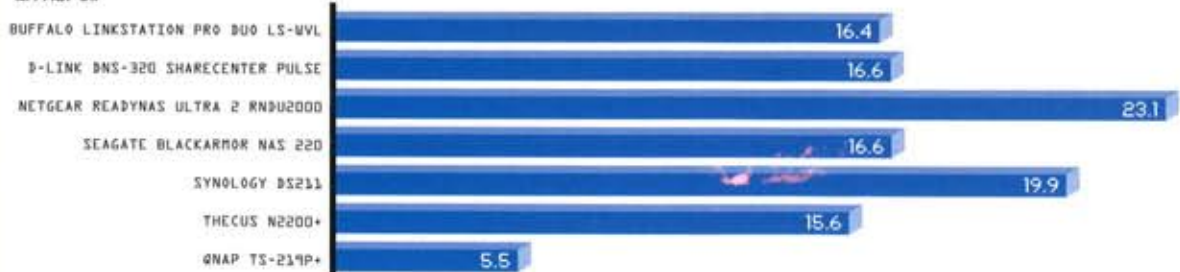
HD Video (IN MB/S.)



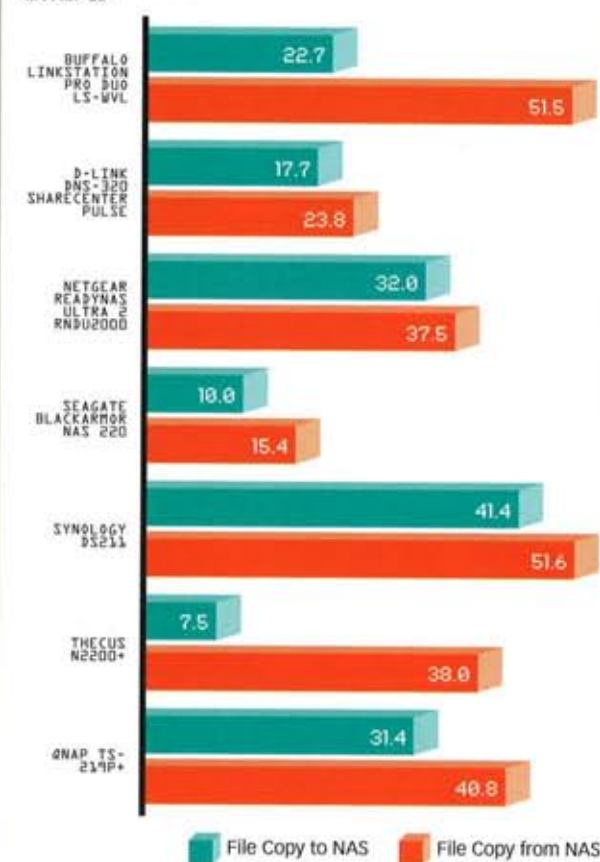
Content Creation (IN MB/S.)



Office Productivity (IN MB/S.)



File Copy (IN MB/S.)



Directory Copy (IN MB/S.)

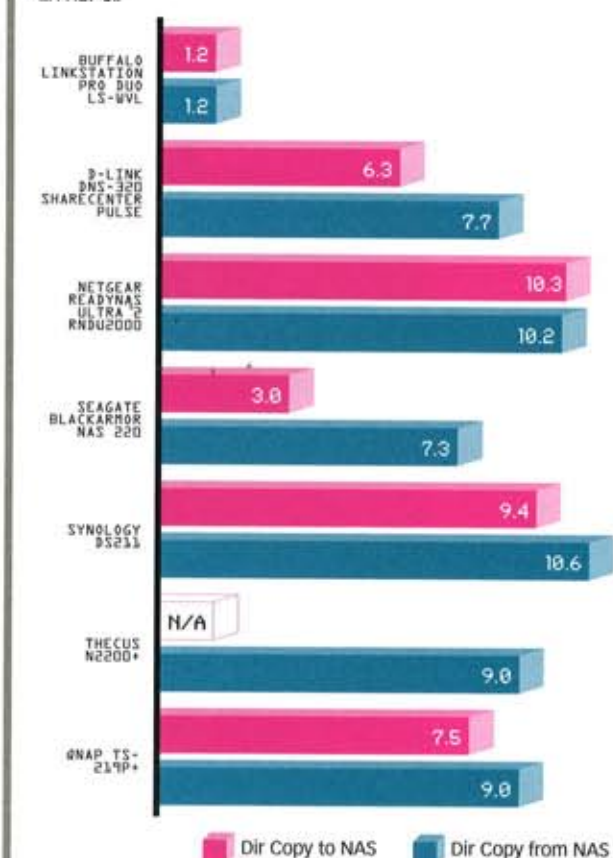
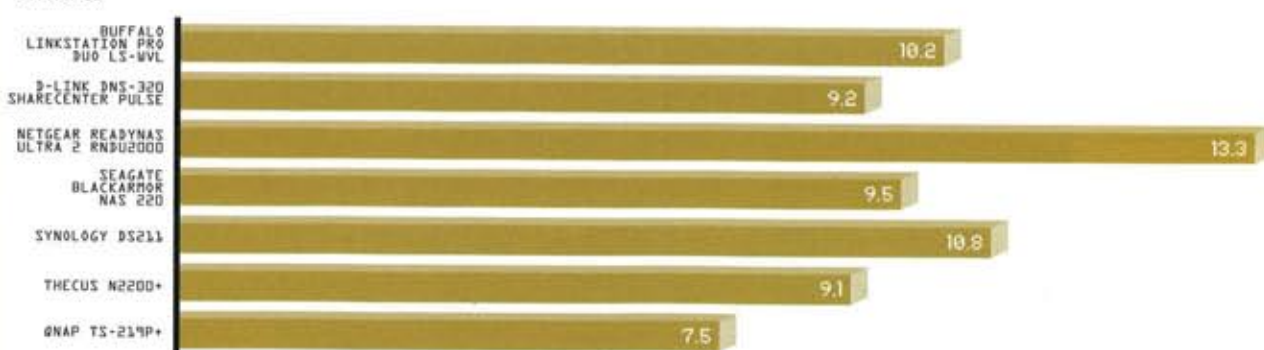









Photo Album (IN MB/S.)



Specifications

MULTI-TEST

COMPUTERS

							
BRAND	BUFFALO	D-LINK	NETGEAR	SEAGATE	SYNOLOGY	THECUS	QNAP
MODEL	LinkStation Pro Duo LS-WVL	DNS-320 ShareCenter Pulse	ReadyNAS Ultra 2 RNDU2000	BlackArmor NAS 220	DS211	N2200+	TS-219P+
PRICE	\$329	\$199	\$880	From \$469	\$490	\$259	\$667
WARRANTY	1 year	1 year	3 year	3 year	3 year	2 year	1 year
CPU	1.6GHz Marvell 88F6282	800MHz Marvell 88F6281	1.8GHz Intel Atom D410 Single Core	800MHz Marvell 88F6192	1.6GHz Marvell 88F6282	Cavium ECONA CNS3420 SOC 600MHz (Dual-Core)	1.6GHz Marvell 88F6282
MEMORY	256MB DDR3	128MB	1GB DDR3	128MB DDR2	256MB	256MB DDR2	512MB DDR3
HDD TRAYS	2x 3.5" (Hot-swappable)	2x 3.5"	2x 3.5" (Hot-swappable)	2x 3.5"	2x 3.5"	2x 3.5" (Hot-swappable)	2x 3.5" (Hot-swappable)
PORTS	1x USB2.0	1x USB2.0	1x USB3.0 (front), 2x USB2.0 (back)	2x USB2.0	3x USB2.0	1x USB2.0 (Front), 1x USB2.0 (Back)	1x USB2.0 (front), 2x USB2.0 (back), 2x eSATA (Back)
LAN	1x Gigabit	1x Gigabit	2x Gigabit (no teaming/failover)	1x Gigabit	1x Gigabit	2x Gigabit (no teaming/failover)	1x Gigabit
WEIGHT	2.31Kg	0.85Kg	2.07Kg	6.16Kg	0.98Kg	3Kg	1.74Kg
POWER CONSUMPTION	26W (Average), 48W (Maximum), 0.7W (Standby)	15.7W (Normal), 8.2W (Sleep)	34W (Typical), 19W (HDD spin-down)	25W constant	22W (Access), 10.8W (HDD hibernation)	N/A	19W (Operation), 7W (Sleep)
FEATURES	FTP server, Web server, Photo server, Download server, Audio server, DLNA/UPnP Media server, Print server, Time Machine	FTP server, Web server, Photo server, Download server, Audio server, DLNA/UPnP Media server, Print server	FTP server, Web server, Download server, Audio server, DLNA media server, Time Machine, Remote media streaming, Print server	Audio server, Download server, DLNA media server, Web server, FTP server	FTP server, Web server, Surveillance, Photo server, Download server, Audio server, DLNA/UPnP Media server, Print server	FTP server, Web server, Surveillance, Photo server, Download server, Audio server, DLNA/UPnP Media server, Print server	FTP server, Web server, Surveillance, Photo server, Download server, Audio server, DLNA/UPnP Media server, iTunes server, Print server
FILE SYSTEM	N/A	EXT3	EXT3	N/A	Internal: EXT3, EXT4; External: FAT32, NTFS	XFS	Internal: EXT3, EXT4; External: EXT3, EXT4, NFS, FAT32, HFS+
VOLUME MANAGEMENT	JBOD, RAID 0, RAID 1	Basic, JBOD, RAID 0, RAID 1	X-RAID2 (RAID 0, 1)	JBOD, RAID 0, RAID 1	Synology Hybrid RAID, Basic, JBOD, RAID 0, RAID 1	JBOD, RAID 0, RAID 1	JBOD, RAID 0, RAID 1
BROWSERS SUPPORTED	Internet Explorer 7, Firefox 3+, Safari 4	Internet Explorer 7, Firefox 3+, Safari 4	Internet Explorer 7.0+, Safari 2.0+, Firefox 2.0+, Opera 9.5+	Internet Explorer 7, Firefox 3+, Safari 4	Chrome 5, Internet Explorer 7 and 8, Firefox 3.5 and 3.6, Safari 4 and 5	Internet Explorer 7, Firefox 3+, Safari 4	Chrome 5, Internet Explorer 7 and 8, Firefox 3.5 and 3.6, Safari 4 and 5

NETWORK STORAGE SHOOTOUT

And the Best Consumer NAS is...



SYNOLOGY DS211

➤➤➤ Synology once again lands the top prize with the DS211 winning our Best Performance Award. And while the DS211 is by no means a high-end NAS to begin with, it delivered excellent performance to top our benchmark tests, as well as throwing in a combination of features and price tag of \$490 that was hard to beat. On the other hand, the QNAP TS-219P+ came real close to dethroning the DS211, and is worth investing in if eSATA and hot-swappable drives are key attraction points for you.

D-LINK DNS-320 SHARECENTER PULSE

➤➤➤ The coveted Best Value Award goes to D-Link's DNS-320, which presented an unbeatable value proposition given its rock-bottom price tag but more-than-serviceable feature set and performance. If quick and easy media serving and backups at home is what you want to do, D-Link's got your back with a minimum of fuss, while saving you some cash to put towards getting a pair of 2TB hard drives.

FINAL WORDS

While the Synology DS211 and the D-Link DNS-320 snagged the top two awards in the group test, the other NAS boxes compared still stood out in one way or another, especially the QNAP TS-219P+ which came really close to taking the DS211's place, but lost out in the performance department by a slight margin. Notable mention goes to Netgear, who put forward a good show with their ReadyNAS Ultra 2 offering, though only the most hardcore of home users (with equally deep wallets) need apply.