

|                             | Asustor AS5002T   | Asustor AS5104T   | D-Link ShareCenter DNS-327L          | Qnap TS-251                                       |
|-----------------------------|---|---|--------------------------------------|---|
| <b>OVERALL</b>              | ★★★★☆   | ★★★★☆   | ★★★★☆                                | ★★★★☆   |
| <b>PRICING</b>              |   |   |                                      |   |
| Part code                   | AS5002T   | AS5104T   | DNS-327L                             | TS-251  |
| Price                       | \$425   | \$699   | \$169                                | \$425   |
| Manufacturer                | asustor.com   | asustor.com   | dlink.com.au                         | qnap.com/1/au                                     |
| Basic warranty <sup>1</sup> | 3yr   | 3yr   | 1yr                                  | 2yr   |
| <b>MAIN FEATURES</b>        |   |   |                                      |   |
| Processor                   | Dual-core 2.4GHz Intel Celeron J1800  | Quad-core 2GHz Intel Celeron J1900  | 1.2GHz Marvell Armada 370            | Dual-core 2.4GHz Intel Celeron J1800              |
| RAM                         | 1GB DDR3L   | 2GB DDR3L   | 512MB DDR3                           | 1GB DDR3L   |
| Disks supplied              | Diskless  | Diskless  | Diskless                             | Diskless  |
| Number of drive bays        | 2   | 4   | 2                                    | 2   |
| User-replaceable drives     | ✓   | ✓   | ✓                                    | ✓   |
| Hot swap                    | ✓   | ✓   | ✗                                    | ✓   |
| Networking                  | 2 x Gigabit Ethernet  | 2 x Gigabit Ethernet  | Gigabit Ethernet                     | 2 x Gigabit Ethernet                              |
| Other ports                 | 2 x eSATA; 3 x USB 3; 2 x USB 2   | HDMI; S/PDIF  | USB 3                                | HDMI; 2 x USB 3; 2 x USB 2                        |
| iSCSI                       | 10 LUN/10 targets   | 256 LUN/256 targets   | ✗                                    | 10 LUN/10 targets                                 |
| Network protocols           | CIFS/SMB; AFP; NFS; FTP; WebDAV; rsync; SSH; SFTP; iSCSI; HTTP; HTTPS; SMB2; TFTP | CIFS/SMB; AFP; NFS; FTP; WebDAV; rsync; SSH; SFTP; iSCSI; HTTP; HTTPS; SMB2; TFTP | SMB; AFP; NTP; WebDAV                | SMB; NFS; AFP; WebDAV                             |
| <b>FUNCTIONS</b>            |   |   |                                      |   |
| Mobile applications         | Android; iOS  | Android; iOS  | Android; iOS                         | Android; iOS                                      |
| External device support     | ✓   | ✓   | ✓                                    | ✓   |
| Media server functions      | UPnP/DLNA; iTunes   | UPnP/DLNA; iTunes   | UPnP/DLNA; iTunes                    | UPnP/DLNA; iTunes                                 |
| Web hosting                 | ✓   | ✓   | ✓                                    | ✓   |
| Managed backup              | ✓   | ✓   | ✓                                    | ✓   |
| Apple Time Machine          | ✓   | ✓   | ✓                                    | ✗   |
| RAID options                | RAID0, 1, JBOD  | RAID0, 1, 5, 6, 10, JBOD  | RAID0, 1, JBOD                       | RAID0, 1, JBOD                                    |
| OS support                  | Windows XP and above; OS X 10.6-10.9  | Windows XP and above; OS X 10.6-10.9  | Windows XP and above; OS X 10.6-10.8 | Windows XP and above; OS X 10.4-10.8              |
| Cloud services              | Dropbox; Google Drive   | Dropbox; Google Drive   | Amazon S3; Google Drive              | Amazon S3; Dropbox; Google Drive; Microsoft Azure |
| Other                       | Surveillance camera support   | Surveillance camera support   | Surveillance camera support          | Surveillance camera support                       |
| <b>PHYSICAL ATTRIBUTES</b>  |   |   |                                      |   |
| Dimensions (WDH)            | 108 x 230 x 164mm   | 170 x 230 x 186mm   | 90 x 195 x 144mm                     | 102 x 225 x 169mm                                 |

|                             | LABS WINNER – 4-BAY<br>Qnap TS-453mini            | Seagate NAS 2-Bay                        | LABS WINNER – 2-BAY<br>Synology DiskStation DS215+  | Synology DiskStation DS715  |
|-----------------------------|---|--|---|---|
|                             | ★★★★☆   | ★★★★☆                                    | ★★★★☆   | ★★★★☆   |
| Part code                   | TS-453mini-8G                                     | STCT8000200                              | DS215+  | DS715   |
| Price                       | \$789   | \$400                                    | \$459   | \$589   |
| Manufacturer                | qnap.com/1/au                                     | seagate.com                              | synology.com  | synology.com  |
| Basic warranty <sup>1</sup> | 2yr   | 3yr                                      | 2yr   | 2yr   |
| <b>MAIN FEATURES</b>        |   |  |   |   |
| Processor                   | Quad-core 2GHz Intel Celeron J1900                | 1.2GHz ARM processor                     | Dual-core 1.4GHz Annapurna Labs Alpine AL-212   | Quad-core 1.4GHz Annapurna Labs Alpine AL-314   |
| RAM                         | 8GB DDR3L   | 512MB DDR3L                              | 1GB DDR3  | 2GB DDR3  |
| Disks supplied              | Diskless  | 2 x 4TB Seagate ST4000VN000              | Diskless  | Diskless  |
| Number of drive bays        | 4   | 2  | 2   | 2   |
| User-replaceable drives     | ✓   | ✓  | ✓   | ✓   |
| Hot swap                    | ✓   | ✓  | ✓   | ✓   |
| Networking                  | 2 x Gigabit Ethernet                              | Gigabit Ethernet                         | 2 x Gigabit Ethernet  | 2 x Gigabit Ethernet  |
| Other ports                 | eSATA; USB 2                                      | USB 3; USB 2                             | eSATA; 2 x USB 3  | eSATA; 2 x USB 3  |
| iSCSI                       | 32 LUN/32 targets                                 | 10 LUN/10 targets                        | 10 LUN/10 targets   | 10 LUN/10 targets   |
| Network protocols           | SMB; NFS; AFP; SFTP; NTP                          | SMB; NFS; HTTP; HTTPS; FTP; SFTP; WebDAV | SMB; AFP; NFS; SFTP; SSH  | SMB; AFP; NFS; SFTP; SSH  |
| <b>FUNCTIONS</b>            |   |  |   |   |
| Mobile applications         | Android; iOS                                      | Android; iOS                             | Android; iOS; Windows Phone   | Android; iOS; Windows Phone   |
| External device support     | ✓   | ✓  | ✓   | ✓   |
| Media server functions      | UPnP/DLNA; iTunes                                 | UPnP/DLNA; iTunes; MTP/PTP               | UPnP/DLNA; iTunes   | UPnP/DLNA; iTunes   |
| Web hosting                 | ✗   | ✓  | ✓   | ✓   |
| Managed backup              | ✓   | ✓  | ✓   | ✓   |
| Apple Time Machine          | ✓   | ✓  | ✓   | ✓   |
| RAID options                | RAID0, 1, 5, 6, 10, 5 + hot spare, JBOD           | RAID0, 1, JBOD; Seagate SimplyRAID       | RAID0, 1, JBOD; Synology Hybrid RAID  | RAID0, 1, JBOD; Synology Hybrid RAID  |
| OS support                  | Windows XP and above; OS X 10.5-10.8              | Windows XP and above; OS X 10.6-10.9     | Windows XP and above; OS X 10.6-10.8; Linux   | Windows XP and above; OS X 10.6-10.8; Linux   |
| Cloud services              | Amazon S3; Dropbox; Google Drive; Microsoft Azure | Amazon S3; Box                           | Amazon Cloud Drive; Amazon S3; Baidu Cloud; Box; Dropbox; Google Drive; hubiC; MegaDisk; OneDrive; Yandex; WebDAV | Amazon Cloud Drive; Amazon S3; Baidu Cloud; Box; Dropbox; Google Drive; hubiC; MegaDisk; OneDrive; Yandex; WebDAV |
| Other                       | Surveillance camera support; IR remote control    | Surveillance Manager (NVR)               | Surveillance camera support   | Surveillance camera support   |
| <b>PHYSICAL ATTRIBUTES</b>  |   |  |   |   |
| Dimensions (WDH)            | 151 x 200 x 210mm                                 | 217 x 173 x 120mm                        | 104 x 232 x 157mm   | 104 x 232 x 157mm   |







< The DS215+ boasts great features for both home and small-business use within the main window, but some open in their own tab, such as the Surveillance Station for monitoring and recording from IP cameras.

Synology has a sizeable database of installable packages, although not quite as large as Qnap and Asustor have on offer. There are options to set the device up as a mail server, Magento, osCommerce or PrestaShop e-commerce website, WordPress blog and many more. In fact, this is virtually a web appliance rather than a mere NAS device.

The DS215+ has plenty of media features, too. You can easily enjoy your collection from a browser window, or connect to the device with a DLNA-compatible player (such as a smart TV) and access the content that way. But there are equally capable professional facilities, including support for joining domains, LDAP and single sign-on clients. You can set up the DS215+ as an iSCSI device with up to ten targets, so it should fit comfortably into a corporate environment.

Costing \$459 for the bare device without drives, the Synology DS215+ isn't a low-budget option. However, it's one of the quickest NAS drives you can buy, particularly when backing up large numbers of small files. There's also a huge range of extra applications you can install to extend the functionality, and a good selection of professional features built in. The DS715 might be a little quicker in some areas, but it's not worth the extra \$130 unless you do a lot of multi-file backups. The DS215+ is our two-bay NAS device of choice this month.



## Synology DiskStation DS215+

EXCELLENT PERFORMANCE, BUILT-IN PRO FEATURES AND HUGE APP EXTENSIBILITY MAKE THIS WORTH THE ASKING PRICE

Synology is one of the most popular brands for NAS devices, with a truly huge range available. The DiskStation DS215+ is a premium two-drive model, with several features that lift it above the more consumer-orientated options. There are two lockable hot-swap drive bays on the front, with two USB 3 ports and two Gigabit Ethernet ports plus eSATA on the rear. There's a hefty 92mm fan on the rear as well, to ensure the hard disks remain cool.

The dual Gigabit Ethernet links can be used for failover or link aggregation, with the latter improving performance. This could well be worth taking advantage of in order to squeeze as much out as possible, since the DS215+ is one of the fastest NAS drives this month. Synology claims the dual-core 1.4GHz Annapurna Labs Alpine AL-212 processor provides superior performance, and where writing is concerned our tests bear this out.

Backup performance was particularly

impressive. The DS215+ took less than half the time of some of its competitors to back up our 10.6GB dataset. Only Synology's quad-core DS715 beat it at this test. This is sure to be a productivity boost, and will make you much more likely to back up on a regular basis. Throughput when writing a large single file was actually faster than the more expensive DS715's at 107MB/sec, although it was beaten by several others in our reading test.

Once your hard disks are installed and the DS215+ is powered up, a simple wizard guides you through configuration and then takes you to the management interface. This is an attractive graphical affair, with a handy configurable widget window in the bottom-right corner, providing CPU, RAM and storage-utilisation readouts. The main menu is found via an icon in the top-left corner, which calls up all the packages you have installed. Most of these open as windows



< The TS-453mini is packed with features view content.

If you've chosen the consumer option the TS-453mini will have apps for photo music and video sharing, as well as for taking advantage of the HDMI port. There's built-in antivirus too, and the unit will act as storage for a network IP surveillance camera. There's a huge selection of apps available, including cloud backup support for Dropbox, Google Cloud Storage, various Amazon S3 resellers, Microsoft Azure and a number of others. You can set up the TS-251 as a web server for e-commerce platforms including PrestaShop, OpenCart, and Zen Cart. WordPress, Joomla, Drupal, phpBB and MediaWiki (used by Wikipedia) can be installed too.

The TS-453mini isn't short on feature then, but it also offers an admirable turn of speed, thanks to its quad-core 2GHz Intel Celeron J1900 and 8GB of DDR3 memory (there's a cheaper 2GB memory version available too). Its write performance with a single large file was the second fastest on test, and its read speed surpassed all others at 110MB/sec. Only the two Synology systems could beat it in the multi-file backup test. If you want a quick backup to huge amounts of RAID5-protected storage, then this device won't disappoint.

The one downside with the Qnap TS-453mini is its price. At almost \$789, it's pricey when you consider that it comes without any storage. Nevertheless, it has the fastest overall performance, good features and great app extensibility. This is a super-quick and comprehensively specified NAS device.

## Qnap TS-453mini

SUPERB PERFORMANCE AND FEATURES MAKE THIS A HIGHLY RECOMMENDED NAS DEVICE, ALTHOUGH IT'S PRICEY

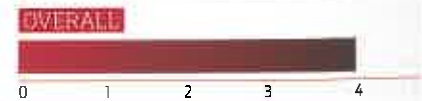
The TS-453mini is Qnap's four-drive entry this month, and, unlike other manufacturers' offerings, the design is completely different to the company's two-drive model. Instead of the front-loading hot-swap system of the TS-251, this chassis loads drives from the top. They're not secured behind a lockable cover, instead, a magnetised panel sits over them, making this a more consumer-friendly device in appearance. You have to be careful not to pick it up by its lid, though, as this will simply detach.

The TS-453mini has something to tempt every type of user. Initial startup allows you to choose whether you're a home or business user; this seems only to affect whether the media applications are installed by default, however, and they can be manually added later anyway. The web interface is exactly the same for either business or home, and the same as on the TS-251. The TS-453mini also sports a HDMI port on the rear so you can use it as a media player.

While the non-lockable lid is a worry for business users, this device uses tool-free rails for hard disk installation, making it a doddle to add disks or swap out a faulty drive. There's no LCD on the front to provide extra information, but the web setup proved to be pretty painless. There's a utility for this, but you can simply find the IP address of the device and point a browser at it – the rest is just a few clicks and tickboxes.

The web-management menu provides an iPhone-like array of icons to access the various functions. Once you delve into the control panel, there's a lot of detailed configuration available. RAID levels include 6 and 5 + hot spare, as well as the 0, 1, 10 and 5 options you'd expect from a four-drive NAS device. You can migrate between RAID levels without losing data, and there's support for a comprehensive range of network protocols.

There's a whole host of mobile apps for iOS and Android too, from which you can manage the NAS, download files, and





## D-Link ShareCenter DNS-327L

A POOR PERFORMER, BUT IT'S THE CHEAPEST NAS DRIVE ON TEST - WORTH CONSIDERING IF YOU'RE ON A TIGHT BUDGET

There's not much more to the DNS-327L than a plastic box with a metal hard drive cage inside and a PCB at the bottom; this is a consumer-orientated unit. The drives aren't hot-swappable, but installing them is still relatively easy. Unhook a plastic lid from the top and install loops onto the drives. They'll then slide in with SATA and power connections at the bottom. Alongside power, there's one USB 3 port and a Gigabit Ethernet port on the rear.

Despite the minimal hardware, the D-Link has a decent selection of features once you delve into the web-based management interface. The twin discs can be configured as RAID0, 1 or JBOD. You can also migrate a single drive to a RAID1 configuration. The USB port can provide print-server capabilities or UPS monitoring, or can be used to connect external storage. Media-streaming options are comprehensive, with DLNA H.264 and iTunes, and there's support for IP security cameras too.

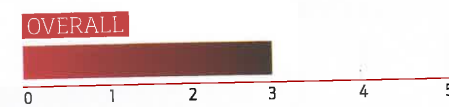
Like others this month, the DNS-327L can be extended with downloadable apps, although this system isn't as easily extensible as, say, Seagate's. However, there are genuinely useful options here, including WordPress blogging, phpBB forums and the Joomla platform, which will turn the D-Link into a mini web server. You can also download directly to the device via FTP, HTTP or BitTorrent P2P, and back up to Amazon S3 or Google Drive cloud storage.

The 1.2GHz Marvell Armada 370 processor and 512MB of RAM is paltry compared to others this month, and the DNS-327L's performance proves that you get what you pay for. Writing speed with a single large file was among the slowest this month, although reading was a little better at 89MB/sec. Backing up multiple small files placed the D-Link bottom of the pack, with a speed of only 13MB/sec.

But the DNS-327L is much cheaper than any other drive on test, making it worth considering if you're on a budget.



▲ The D-Link is the cheapest device on test



## Qnap TS-251

A CAPABLE NAS DRIVE, BUT SLOW WRITING PERFORMANCE PUTS IT OUT OF THE RUNNING FOR AN AWARD

Qnap is one of the many Taiwanese vendors producing NAS devices. The TS-251 is a mid-range, two-drive option aimed at home and small-office usage. Two hot-swap bays are located on the front, although the caddies are entirely made of plastic, and don't have a lock to prevent removal.

Although the TS-251 does have business pretensions, it's clear from the attractive white finish and hardware features that this is primarily a consumer device. Confirming this is the HDMI port, which, in tandem with the appropriate software, will allow you to use the TS-251 to watch downloaded video, or even live and recorded TV with the appropriate hardware adapter.

There's a USB 3 port on the front, making it easy to plug in a flash drive or external hard disk. There's a second USB 3 and a pair of USB 2 ports on the rear, and all USB ports support printers, Wi-Fi adapters and UPS control. There are also two Gigabit Ethernet ports to play with.

There's a huge range of installable apps

available, from cloud storage to PHP-based web platforms. A number of USB digital TV tuners are supported, and you can install a couple of different control and recording apps. There's Surveillance Station for IP cameras, Moodle for creating your own education server, and home-automation apps too.

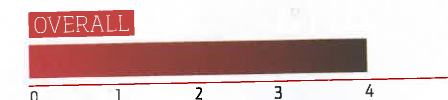
More good news for home users is the TS-251's parsimonious power consumption. When sitting idle, it uses only half the energy of its sibling, the Qnap TS-453mini, at only 16W – and uses only a couple of watts more when under peak load.

With a 2.4GHz dual-core Intel Celeron processor onboard, the TS-251 promises a decent turn of speed, although our review sample offers only 1GB of DDR3 memory (there's a more expensive 4GB version available). Performance was erratic in our tests. Its large contiguous file writing performance wasn't stunning, representing one of the slowest results this month at only 56MB/sec – yet read performance was the second quickest, at



▲ The TS-251 is one of the least power-hungry devices on test

109MB/sec. Multi-file backup was in the middle of the pack, at 20MB/sec. Pricing is similarly middle of the range. Overall, this is a decent NAS device with a fair range of features.



## Seagate NAS 2-Bay

THE SLOWEST DEVICE ON TEST OVERALL, BUT WITH 8TB OF STORAGE INCLUDED IT IS AT LEAST GOOD VALUE

As one of the leading hard-drive manufacturers, Seagate is hardly a surprise entry this month. Its business NAS range includes two- and four-drive options; our sample was the two-drive version. This is a serious-looking black box with twin hot-swap bays on the front. Only a single Gigabit Ethernet port is available, but there are USB 3 ports front and back.

The 2-Bay is available with 4TB, 8TB or 10TB of storage. Ours was the medium option, sporting a pair of 4TB Seagate ST4000VN000 drives; these are NAS-specific units rated for 8,670 power-on hours (around one year) and one million hours of MTBF, with a three-year warranty. The drives can be configured as RAID0, 1 and JBOD.

The web configuration interface is user-friendly, with decent features. Network-protocol support is comprehensive, with SMB, NFS and AFP all present, alongside HTTP and HTTPS, FTP, SFTP and WebDAV. There's 10-

LUN/device iSCSI support, making the 2-Bay fit for more corporate environments.

There's an open API for third-party apps, which can be installed via the web interface. Seagate's apps include antivirus, a surveillance manager for attached IP cameras, and a cloud backup manager. There's a Plex app to turn the NAS into a media server, BitTorrent Sync, and the WordPress blogging platform, among others, making this a flexible and general-purpose NAS. Overall, though, the app selection isn't as extensive as some other manufacturers'.

With a 1.2GHz ARM processor and 512MB of DDR3 memory, this isn't the meatiest NAS in terms of hardware, and it shows in the performance. The 2-Bay was the slowest when writing the large file at only 54MB/sec – less than half the speed of the fastest drives – although performance was much more acceptable when reading it back. It was particularly



▲ This business NAS is a serious-looking black box

slow for the multi-file backup. It's not a gloom for Seagate, though: the two 4TB hard disks would set you back around \$500 on their own, so it's decent value despite the speed shortcomings.



## Synology DiskStation DS715

DECIDEDLY FAST, BUT IT'S THE MOST EXPENSIVE DISKLESS TWO-BAY NAS DRIVE ON TEST

The Synology DiskStation DS715 is almost identical to the DS215+. It's a two-drive chassis with the same design. There are two hot-swap bays on the front, which can be locked shut with an Allen key. We'd recommend doing so: they're a bit too easy for casual office thieves to pop open with a simple push otherwise.

On the rear can be found a couple of USB 3 ports and a pair of Gigabit Ethernet ports, plus eSATA. A front-facing USB 3 port would have been useful, and there's no HDMI, but neither are essential.

When it comes to the software, Synology has the balance right between features and usability, with both Basic and Advanced modes available. There's a comprehensive selection of downloadable apps, including a capable IP camera surveillance tool and antivirus, and web-server PHP frameworks, although the selection isn't as extensive as some manufacturers'.

Where the DS715 differs from the DS215+ is in the core hardware specification. Instead of a dual-core

1.4GHz Annapurna Labs Alpine AL-212 processor with 1GB of DDR3 memory, there's a quad-core 1.4GHz Annapurna Labs Alpine AL-314 processor with 2GB of DDR3 memory. In theory, this should make the DS715 faster than the DS215+, particularly with processor-intensive tasks, but our benchmark tests revealed that the superior hardware didn't make a huge difference.

When writing a large file, the DS715 was one of the fastest at 103MB/sec, although the DS215+ was marginally quicker in our testing. In the all-important multi-file backup, the DS715 reigned supreme: it was noticeably quicker than any other NAS device this month, and more than twice as fast as some at 33MB/sec. Unfortunately, as with the DS215+, large-file reading performance wasn't so stunning – the DS715 delivered a below-average speed of 81MB/sec, marring an otherwise impressive show in our benchmarks.

The Synology DiskStation DS715 is the most expensive two-bay diskless NAS drive on test this month. It may be



▲ Despite more impressive hardware, there isn't a huge difference between the DS715 and its cheaper sibling. Blisteringly quick at backing up smaller files and copying across larger ones, but the DS215+ is almost as quick and \$130 cheaper, making it the more sensible tv drive choice.

