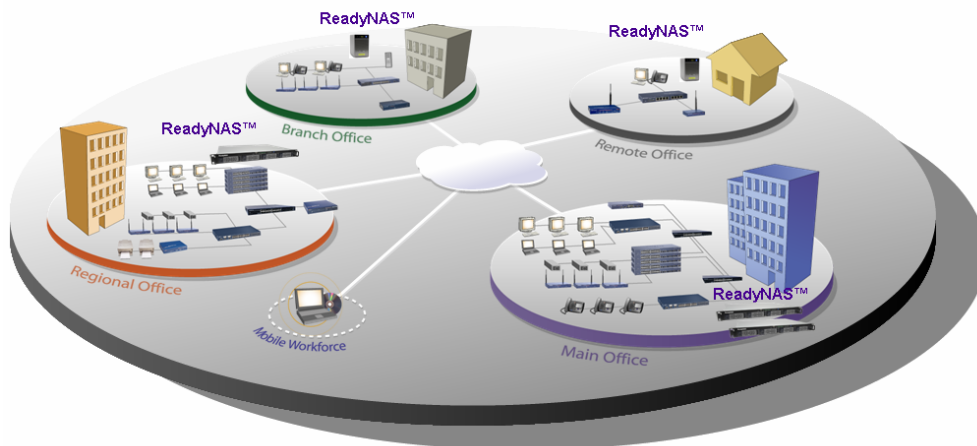




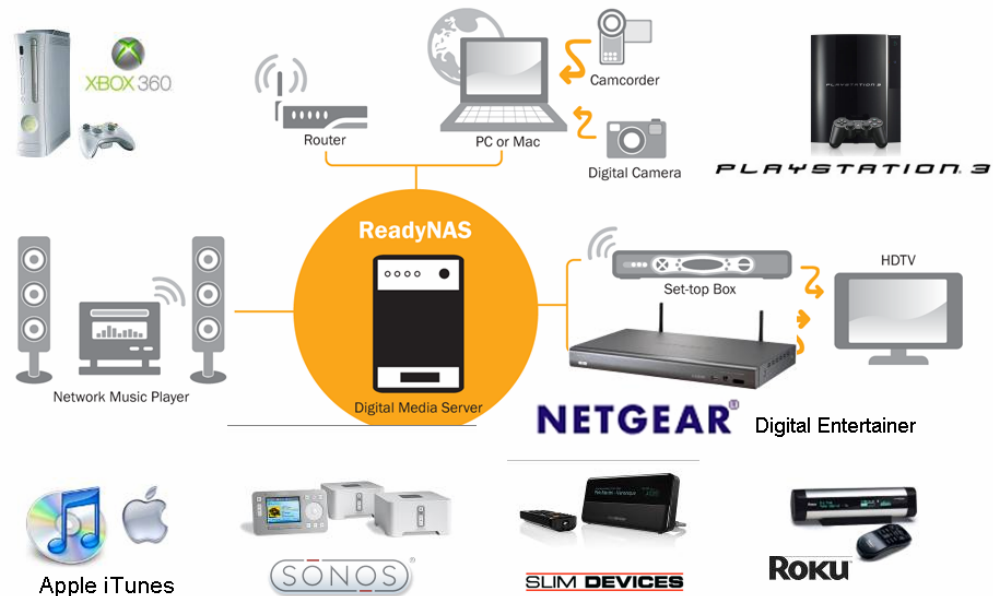
# Which ReadyNAS – Buyers Guide

## ReadyNAS™ for Business Solutions



A Comprehensive Guide for, selecting the most appropriate NETGEAR ReadyNAS Product for your requirements.

## ReadyNAS™ for Media Streaming



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## Which ReadyNAS-Buyers Guide-Commissioned by eAegis.

Potential Network Attached Storage buyers may not find it easy to make a decision as to which ReadyNAS to purchase. Considerable thought needs to be given to factors such as features, performance, price, service and upgradeability to mention a few. Now, more than ever, it is easy to get lost in the “hype”, so to avoid regrets later, eAegis has designed a best practices guide to buying a NETGEAR ReadyNAS, be it a ReadyNAS NV+ or a ReadyNAS 1100. This is the result of over four years experience in marketing, selling, and supporting the ReadyNAS product range. From inception, we assist our customers to objectively assess, analyze, design and economically justify the ReadyNAS architecture most appropriate for their specific needs. A feat that is unsurpassed by any other ReadyNAS VAR or reseller.

## Consider long term (and not short term) needs.

Storage requirements continue to grow at an unprecedented rate with some estimates seeing a doubling in storage needs every 12-18 months. The rapid growth in the amount of data to be stored needs to be taken into account to accommodate these growing needs over a number of years. One of the most critical aspects is to explore potential upgrade paths, and to consider how future upgrades will impact on the performance and overall cost of the NAS device.

## Consider the protection methodology for a Network Attached Storage device.

It is simplistic to think it is only a matter of dropping data onto disk and not being concerned about anything else.

No storage device is that simple. Any credible NAS device will have RAID functionality as a minimum feature. RAID (**Redundant Array of Independent Drives or Disks**), also known as (**Redundant Array of Inexpensive Drives or Disks**), along with **Snapshot** and **Replication** technologies are therefore common features of any quality NAS device.

If the intention is to use RAID and also to utilize **Snapshot** within the NAS device, it will have a tremendous impact on the overall storage capacity. On the other hand, if wishing to take **Snapshots** or replicate data outside of the NAS, then adequate extra storage must be considered to support those procedures.

## Consider the impact on the current infrastructure

Once a NAS device is installed, and in use, it will inevitably result in increased traffic on the network segment. This leads to complaints of a slowing down of the NAS device, and performance bottle-necks within the segment. It is essential therefore to understand the implications of increased traffic, and to make allowance for any future upgrades or infrastructure changes that may be required. A typical scenario would be that having added a NAS device to a lightly used network segment, there would be a necessity to upgrade from 100Mbps Ethernet to 1Gbps or 100Gbps in an active environment. The need to upgrade becomes more obvious in a wireless environment, where the loss of performance, from the protocol aspect, necessitates a mandatory upgrade.

## Consider Network Attached Storage Availability

What are the availability requirements? For a NAS to be highly available it may require a second device for replication purposes, where a failure will allow the secondary NAS to take over. The critical factor determining availability is driven by the positioning of the NAS within the storage structure and whether it is implemented as a primary, secondary NAS or is for archival purposes.

## Consider Network Attached Storage Back-up

This is probably the most neglected area when buying Network Attached Storage. How is the data on the NAS going to be protected in case of failure beyond the RAID redundancy? Normally RAID is the only protection and is considered to be sufficient. What happens if the device has a failed power supply? Can anyone afford to wait for a replacement?

## Consider the Support and Service for a Network Attached Storage Device

Implementing a Network Attached Storage device is only part of the story. Ongoing support for the NAS device is an important consideration, even more so if it is the first NAS device to be implemented and connectivity is not a strong point. In this event, strong emphasis should be given to, ease of use, installation and ongoing services. The manufacturer's warranty and accessibility are important factors too, particularly if the device falls into the high availability category.

### NETGEAR ReadyNAS NV+

Infrant Technologies (now a NETGEAR company) designed and manufacture the ReadyNAS product range. The ReadyNAS NV+ was designed specifically for home offices, small businesses and workgroups. A cost -conscience Network Attached Storage (NAS)



**ReadyNAS™ NV+**

The Superior NAS for  
Office and Home

device packed with robust high-end server features, including Gigabit Ethernet, Hardware RAID, system monitoring capabilities and built-in backup. The industrial design and ultra compact form factor of the ReadyNAS makes it perfect for any home office or small business. Standing only eight inches tall and five inches wide, it can fit in any entertainment center or on any desk without taking up much space or making much noise. ReadyNAS also offers low power consumption and a special energy-saving mode that allows you to automate start up and shutdown.

Complete Overview - see Appendix A. Overall Specification-see Appendix B.

### NETGEAR ReadyNAS 1100 Network Attached Storage Device



**ReadyNAS™ 1100**  
The Ultra Efficient 1U NAS

Infrant Technologies (Now a NETGEAR Company) design and manufacture the ReadyNAS 1100 product range. The ReadyNAS 1100 is a new class of NAS designed to meet the requirements of increasingly energy efficient computing environments, by carefully

tailoring a Linux based operating system with a custom microprocessor, the 1100 removes traditional complexity, efficiency and interoperability barriers. The ReadyNAS 1100 packs 2 gigabit interfaces, hardware RAID and 4 hot swap SATA drive bays, all in a remarkable 12 inch deep 1U chassis! Quickly add network storage for any workgroup or department with the ReadyNAS 1100.

Complete Overview-see Appendix C. Overall Specification-see Appendix D.

## Understanding Standard RAID Levels.

### RAID 0

A **RAID 0 Set** (also known as a **Stripe Set** or **Striped Volume**) splits data evenly across two or more disks with no parity information, for redundancy. It is important to note that RAID0 was not one of the original RAID levels and provides **no data redundancy**. RAID 0 is normally used to increase performance, although it can also be used as a way to create a small number of large virtual disks from a large number of small physical ones. The ReadyNAS can have 4 drives each divided into two volumes, consisting of two RAID 0 sets. This is only available under **Flexible** RAID mode.

### RAID 1

A **RAID 1 set** creates an exact copy (or **Mirror**) of a set of data on two or more disks. This is useful when read performance or reliability is more important than data storage capacity. Such an array can only be as big as the smallest capacity disk in the array. A typical RAID 1 mirrored array contains two disks, which increases reliability **geometrically** over single disks. Since each disk contains a complete copy of the data, they can be addressed independently. Wear and tear, reliability is raised by the power of the number of self contained copies.

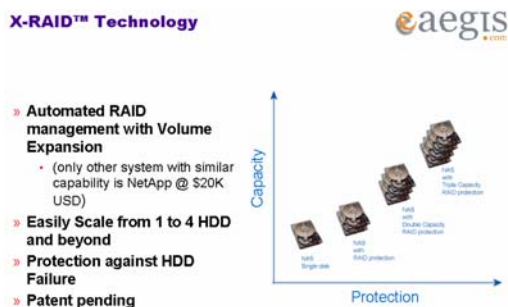
### RAID 5

A **RAID 5 set** uses **block level striping** with parity data distributed across all member disks. RAID 5 has achieved popularity due to the low cost of redundancy. Generally RAID 5 is implemented with hardware support for parity calculations. A minimum of 3 disks are generally required for a complete RAID 5 configuration. A RAID 5 2 disk is technically possible but many implementations do not allow for this. In some situations a degraded disk set can be made (3disks of which only 2 are online).

## Considerations for selecting the correct RAID setting for the ReadyNAS NV+ and ReadyNAS 1100

The ReadyNAS NV+ and the ReadyNAS 1100 are both based on hardware accelerated RAID levels 0, 1 and 5 in addition to Infrant's (NETGEAR) own X-RAID technology. Both technologies ensure full data redundancy, with protection against hardware failures. Therefore if one drive fails, the data volumes can rebuild by replacing the failed disk. Without RAID once a failure occurs, there is a risk of losing all stored data on the drives. Two RAID technologies are available and the selection criteria are based on specific requirements. Selection being made prior to the initial RAID synchronization (factory default stage).

### Expandable RAID (X-RAID)



X-RAID is an Infrant (NETGEAR) patented RAID technology that simplifies and automates RAID management. X-RAID utilizes a one-volume technology with built in volume expansion support, either when adding additional disks or replacing existing disks with ones of a larger capacity. For instance it is possible, to initially have one disk, and add up to another three, as and when extra capacity is needed or becomes affordable. Add a second disk; it becomes a mirror to the first RAID 1, providing protection from disk

failure. Adding a 3<sup>rd</sup> disk, the capacity doubles a 4<sup>th</sup> triples the capacity. Expansion occurring while maintaining redundancy.

X-RAID provides further expansion capability. At a future point in time each disk can be replaced one by one with a larger capacity disk, allowing each to rebuild. After the last disk has been replaced and rebuilt the volume automatically expands to the new capacity. This future-proof technology allows for continuous expansion as larger capacity disks and firmware support becomes available.

## **X-RAID PROS**

Ability to start with the least number of drives and add additional drives when required for the volume to rebuild on the fly without having to back up the previous volume and restoring once completed.

X-RAID offers the same redundancy as Flexible RAID i.e. two disks will equate to RAID1 (mirroring) 3 or 4 disks will equate to RAID5.

X-RAID also has a performance advantage in that it is optimized for larger sequential access request pattern, such as video streaming and editing. The improvement over Flexible RAID, with large data transfers can be as high as 10-15%

## **X-RAID CONS**

X-RAID only supports a single volume; hence dividing 4 drives into two volumes of 2 each is not possible.

## **Flexible RAID (RAID 0, 1 and 5)**

Flexible RAID is an industrial Standard, providing levels 0, 1 and 5. Selecting Flexible RAID allows access to full volume management. This is critical if flexibility is required in any implemented plan providing redundancy. Installing 2 drives can support RAID 0 or RAID 1 adding an additional 1 or 2 drives it is possible will support RAID 5 or two volumes in a number of permutations. Flexible RAID has the flexibility of assigning an unused disk as a HOT SPARE; the drive will kick in replacing a failed drive. A typical setup being 3 disks configured in RAID 5 and the 4<sup>th</sup> assigned as a spare. If more capacity is needed each disk can be replaced one by one, when the last disk is replaced another volume can be created utilizing the new available space.

## **Flexible RAID PROS**

Multiple volumes provide greater control and flexibility when it comes to planning redundancy strategies.

RAID 5 is well suited to most office environments as it excels in performance within small random access patterns.

## **Flexible RAID CONS**

It is not as flexible as X-RAID if wishing to expand on the fly.

## **What advantages are their from using Expandable RAID (X-RAID) over Flexible RAID (Conventional RAID).**

The ReadyNAS systems support both RAID levels. Flexible RAID is an industry-standard RAID level whereas X-RAID is an Infrant patented RAID technology that simplifies and automates the RAID management process. X-RAID utilizes a one-volume technology with built-in volume expansion support, either by adding more disks or by replacing existing disk with larger capacity disks. For instance, you can start out with one disk, and add up to 3 more disks when you need more capacity or when you can afford them. Volume management is automatic. Add a 2nd disk, it becomes a mirror to the first, providing protection from a disk failure; add a 3rd, the capacity doubles; add a 4th, and your capacity triples – the expansion occurring while maintaining redundancy.

X-RAID also provides further expansion capability. At a future point in time, each disk can be replaced one by one, have it finish rebuilding, and after the last disk is replaced, your volume automatically expands utilizing the new capacity. This future-proof technology allows you to continuously expand as higher-capacity disks become available.

Performance-wise, X-RAID is optimized for larger sequential access request pattern, such as video streaming and editing. The performance ratio over Flexible RAID in large data transfer can be as much as 10-15% better.

### **NETGEAR ReadyNAS NV+ Standard product range.**

**NETGEAR READYNAS NV+ 4-BAY GIGABIT DESKTOP NETWORK STORAGE (NO DISKS) RND4000.** This product replaces the RNV2-S2-0000 formally Infrant's product code for the diskless system.

For the technically minded, the ReadyNAS NV+ RND4000 diskless offers the ideal opportunity to configure a system from scratch. Just mount the disks in the trays (with the screws provided). Carry out a one step factory default procedure to build the selected RAID level. Depending on the capacity of the drives installed it can take between 1.5 hours to 14 hours to complete the process. For example 2x250GB will take approximately 1.5 hours, whereas 4x750GB will take approximately 14 hours.

### **PROS:**

The availability of a diskless unit enables customers to purchase a unit and add disks as and when required. Also providing the opportunity to purchase one for, secondary backup, or for replication purposes, or being utilized for SNAPSHOTS, adding the minimum of drives for the purpose. Thus, allowing continuity in times of disaster. NETGEAR now offers a 5 year warranty with the NV+ giving it an excellent value for money ratio and one that equates to confidence in the quality of the product.

### **CONS:**

In 2004 eAegis introduced a comprehensive 48hr burn in test for both the system and the drives. This obviously would not be available for the diskless. Man hours taken to configure a system. If things go wrong who sorts it?

**NOTE:** it is recommended that only drives that are on the NETGEAR compatibility list should be used. The link is as follows [ReadyNAS NV+ and ReadyNAS 1100 Hard disk Compatibility Guide](#)

eAegis commenced integrating ReadyNAS products with Seagate Drives in 2004, and have found these, the best for performance and value. Performance monitoring has also established that Seagate SATA drives are best when

compared with the other branded rivals. eAegis have found Western Digital WD5000YS drives to be the most unreliable. Albeit Enterprise level drives they have constantly failed with hardware sector faults, and were discontinued by eAegis shortly after their introduction. To date they are not recommended on the Manufacturers hard disk compatibility section.

## **NETGEAR ReadyNAS NV+ 1TB Gigabit Desktop Network Storage (4X250GB) RND4425**

Entry level ReadyNAS NV+ pre-installed with Seagate Disks. Ideal for the budget, or low data overhead buyer, who desire, the facility of X-RAID or RAID 5 data redundancy as part of their solution.

Implementing RAID 5 requires a minimum of 3 disks; the ReadyNAS NV+ RND4425 aptly meets this requirement.

### **PROS:**

Instant RAID 5, which stripes both data and parity information across all drives, whilst delivering fault tolerance. Thus ensuring data is recoverable in the event of a disks failure. Purchasing a pre-installed system has the added benefit of eAegis 48hr burn testing at no extra cost and is delivered ready to plug and play.

### **CONS:**

All 4 bays populated, therefore limited upgradeability without replacing all 4 drives with a larger capacity. Drives must be replaced one by one (allowing a rebuild with each one replaced) not until the last disk has been replaced will the volume expand. RAID 5 takes about 25% of the total capacity, to ensure data protection. Overall usable capacity for this configuration is approximately 653GB in both X-RAID and RAID 5.

## **NETGEAR ReadyNAS NV+ 1TB Gigabit Desktop Network Storage (2X500GB) RND4250**

The 1TB ReadyNAS NV+ (RND4250) Pre-installed with Seagate NS drives, would be a choice based on strategy. It allows for expansion whilst having an initial decent capacity, having the benefit of Seagate ES Enterprise (ST3500630NS) drives. Configured in X-RAID, adding further 500GB drives, one by one, should cause no problems, the volume automatically expanding after the last disk is fitted. In Flexible RAID it will be necessary to back everything up and then recreate the new RAID level prior to restoring the data.

**Note:** Many resellers continue to market the older model NV+ that integrate Seagate (ST3500630AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

### **PROS:**

Excellent choice, low start up costs, it provides an excellent platform for expansion. Selection of the RAID level requires careful examination; the choices are RAID 0 or RAID 1. If configured under X-RAID two drives will emulate RAID 1 and expansion will be automated. Purchasing a pre-installed system has the added benefit of eAegis 48hr burn testing at no extra cost and is delivered ready to plug and play.

### **CONS:**

None worthy of mention.

## **NETGEAR ReadyNAS NV+ 2TB Gigabit Desktop Network Storage (4X500GB) RND4450**

The ReadyNAS NV+ 2TB currently commands the keenest of street price, a bargain for a solid 2TB device, providing 1.4TB of usable storage. Along with the RND4250 and RND4450 it is integrated with Seagate Enterprise drives. These drives are classified as one of the best in their class. The ST3500630NS drives have proven the most reliable in our lab tests, with zero faults, unlike the ST3500630AS variant. The configurations options (using Flexible RAID) are varied. Two volumes, of two drives each, under RAID 0 or 1. One volume with 3 disks with RAID 5 using the 4<sup>th</sup> as a Hot Swap spare. 4 disks, configured in RAID 5. X-RAID will automatically configure to 4 drives in RAID 5.

### **PROS:**

Flexibility of configurable RAID levels.

### **CONS:**

All four drive bays being used, increasing capacity would necessitate changing all 4 drives, one by one.

## **NETGEAR ReadyNAS 1100 Standard product range.**

### **ReadyNAS 1100 2TB Dual Gigabit Rack mount Network Storage (4X500GB) RNR4450**

The ReadyNAS 1100 is specifically designed for the small office and workgroups. Constructed in an ultra-short 12 inch rack mount case. The efficient rack mountable 1U is cost effective as well as rich in features. The 2TB system has a usable capacity of 1.6TB in X-RAID or RAID 5 modes. The ReadyNAS 1100 can be installed back to back with two units on one back plane. This unique feature separates it from its competitors. The diminutive size and rapid system board replacement module, aptly named X-Change. Remove two screws and the complete back panel pulls out, which houses the main architecture inclusive of the system board.

#### **PROS:**

Sleek, easy maintenance, small, rich in features, Innovative design with low power consumption 70-75W.

**Note:** Many resellers continue to market the older model 1100 that integrate Seagate (ST3500630AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

#### **CONS:**

None worthy of mention.

### **ReadyNAS 1100 3TB Dual Gigabit Rack mount Network Storage (4X750GB) RNR4750**

The ReadyNAS 1100 is specifically designed for the small office and workgroups. Constructed in an ultra-short 12 inch rack mount case. The efficient rack mountable 1U is cost effective as well as rich in features. The 2TB system has a usable capacity of 1.6TB in X-RAID or RAID 5 modes. The ReadyNAS 1100 can be installed back to back with two units on one back plane. This unique feature separates it from its competitors. The diminutive size and rapid system board replacement module, aptly named X-Change. Remove two screws and the complete back panel pulls out, which houses the main architecture inclusive of the system board.

#### **PROS:**

Sleek, easy maintenance, small, rich in features, Innovative design with low power consumption 70-75W.

**Note:** Many resellers continue to market the older model 1100 that integrate Seagate (ST3750640AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

#### **CONS:**

None worthy of a mention.

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## **NETGEAR ReadyNAS NV+ eXtended range by eAegis**

eAegis have been a Network Storage Integrator of the ReadyNAS range since its original launch. eAegis is therefore strategically positioned to provide an extended range of ReadyNAS product portfolio. The extended range incorporates NETGEAR's 5 year warranty, along with our quality assurance, backed by our 48hr burn testing. Our customers receive their system, totally prepared and ready to use within 15mins of unpacking and setting up. Our extended range uses only the finest hard drives, based on the Enterprise platform, being manufactured specifically for critical RAID based applications. Currently the only manufacturer that is able to provide the quality, performance, backed by a 5 year warranty is Seagate.

For a complete list of drives see Appendix E

**Necessity is the mother of invention**

...Plato

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## **NETGEAR ReadyNAS NV+ 4-Bay Gigabit Desktop Network Storage (no disks) RND4000**

You may ask, why buy a diskless system from us?

All our diskless systems are tested prior to shipping. This allows for ZERO fault tolerance policy at all times.

Our customers have the flexibility to select any capacity hard disks. We then integrate them into the RND4000 for our customers with our exclusive 48hr burn testing.

## **NETGEAR ReadyNAS NV+ 4-Bay Gigabit Desktop Network Storage (no disks) RND4000 1GB memory**

Formerly known as RNV2-S4-0000, being, a ReadyNAS NV+ with 1GB of memory. First launched by eAegis and later adopted by Infrant. We continue to provide this upgrade with all models.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain

## **NETGEAR ReadyNAS NV+ 1TB 4-Bay Gigabit Desktop Network Storage (2x500GB) RND4250**

This is our entry level system for our extended range On the basis of value for money eAegis have opted not to offer the RND44250 (4x250GB) as part of their extended product range. The system is integrated with 2 x Seagate ST3500630NS drives. Allows for future growth by adding additional 500GB drives. All systems are prepared and tested for 48 hours prior to shipping. Ready to use out of the box.

### **UPGRADE:**

The RND4250 is available with a 1GB Memory Upgrade.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain.

**Note:** Many resellers continue to integrate Seagate (ST3500630AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

## **NETGEAR ReadyNAS NV+ 1.5TB 4-Bay Gigabit Desktop Network Storage (3x500GB) RND4350**

This model is designed for those wishing to avail themselves of the features and benefits of RAID 5 using the minimum of disks. The system comes integrated with 3 x Seagate ST3500630NS drives, allowing for further upgrade by completing the disk set. All systems are prepared and tested for 48hrs prior to shipping, thus ready to use straight from the box, at no extra cost.

### **UPGRADE:**

The RND4350 is available with a 1GB Memory Upgrade.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain.

**Note:** Many resellers continue to integrate Seagate (ST3500630AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

## **NETGEAR ReadyNAS NV+ 2TB 4-Bay Gigabit Desktop Network Storage (4x500GB) RND4450**

The same model provided by NETGEAR. The ReadyNAS NV+ 2TB is integrated with the same drives as the RND4250 and RND4350.

### **UPGRADE:**

The RND4450 is available with a 1GB Memory Upgrade.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain.

**Note:** Many resellers continue to integrate Seagate (ST3500630AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise

## **NETGEAR ReadyNAS NV+ 1.5TB 4-Bay Gigabit Desktop Network Storage (2x750GB) RND4275**

An eXtended model from eAegis with 2 x750GB Seagate ST3750640NS drives, an entry level model based on 750GB drives, allowing for a potential expansion to 3TB. The system will have a capacity of 761GB under RAID 1 or X-RAID.

### **UPGRADE:**

The RND4275 is available with a 1GB Memory Upgrade.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain.

**Note:** Many resellers continue to integrate Seagate (ST3750640AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

## **NETGEAR ReadyNAS NV+ 2.25TB 4-Bay Gigabit Desktop Network Storage (3x750GB) RND4375**

This model is designed for those wishing to avail themselves of the features and benefits of RAID 5 using the minimum of disks. The system comes integrated with 3 x Seagate ST3750640NS drives, allowing for further upgrade by completing the disk set. All systems are prepared and tested for 48hrs prior to shipping, thus ready to use straight from the box, at no extra cost.

### **UPGRADE:**

The RND4375 is available with a 1GB Memory Upgrade.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain.

**Note:** Many resellers continue to integrate Seagate (ST3750640AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

## **NETGEAR ReadyNAS NV+ 3TB 4-Bay Gigabit Desktop Network Storage (4x750GB) RND4475**

The 3TB system provides a total usable capacity of over 2TB. All RAID levels can be deployed, RAID 0 and 1 in two volumes, or, RAID 5 as a single volume. X-RAID will configure to RAID 5 single volume but allow drive capacity to be increased with ease.

The system is integrated with 4 x Seagate ST3750640NS drives, a full 3TB at a stunning price. All systems are prepared and tested for 48Hrs prior to shipping and ready to use out of the box at no extra cost.

### **UPGRADE:**

The RND4475 is available with a 1GB Memory Upgrade.

Upgrading memory on the ReadyNAS NV+ can improve performance for memory intensive tasks such as rsync backups, indexing of media files (i.e. Slimserver), and accessing folders containing a large number of files. Large file streaming has shown to improve about 12% when going from standard 256MB to 1GB. We also understand VISTA performance can be enhanced by going to 1GB memory and using the upcoming RAIDiator 4 when it is released into public domain.

**Note:** Many resellers continue to integrate Seagate (ST3750640AS) Desktop drives. We would strongly recommend you elect to buy systems integrating the ES drives, the price differential not justifying otherwise.

## RAID Options for the ReadyNAS

### RAID Options using Expandable (X-RAID).

1 Disk	RAID 0
2 Disks	RAID 1
3 Disks	RAID 5
4 Disks	RAID 5

NOTE: Please be aware that X-RAID does not support hot spare

### RAID Options using Flexible RAID

1 Disk	RAID 0
2 Disks	RAID 0 or RAID 1
3 Disks	2 disks in RAID 1 and 1 disk in Raid 0 2 disks in RAID 0 third as hot swap spare 2 Disks in RAID 1 third as hot swap spare 3 Disks in RAID 5
4 Disks	2 volumes of 2 Disks each in RAID 1 or RAID 0 2 Volumes of 2 Disks each 1 RAID 1, 1 RAID 0 3 Disks in RAID 5 fourth in RAID 0 3 Disks in RAID 5 fourth as hot swap spare 4 Disks in RAID 5

**These are just a few permutations that are possible with the ReadyNAS**

## Why buy from eAegis

Since 2003 eAegis has been delivering ReadyNAS storage solutions to business and home users. With our in depth knowledge of the storage sector we are able to assist our customers, design, integrate and manage the evolution of their infrastructures to remain adaptive to their individual needs. We deliver the following enhanced storage services:

### Global Storage Partners

eAegis has partnered with Infrant Technologies since 2003 as a ReadyNAS Premier VAR and has since transitioned to become a leading NETGEAR ReadyNAS Platinum partner.

### Pre-Sales Support

Our experienced and highly successful networking and storage professionals are pleasant to deal with and proactively responsive. Our sales professionals are fully ReadyNAS aware, and with a strong background in both business and home markets, this unusual combination of skills allows us to meet the exacting needs of our customers. We can guide you from evaluation through to installation. If required we can also prepare your system to your exact need.

On the rare occasion that a problem occurs, it is dealt with promptly and courteously.

### Customized ReadyNAS Solutions

eAegis offers a wide array of custom-tailored ReadyNAS solutions and services to fulfill your NAS requirement. We can assist you transform your needs, to a solution match to ensure the return on your investment is optimization.

### Beyond-the-box services

When you are ready to purchase your ReadyNAS, we will provide a service beyond the box. We prepare your system, by setting the requested RAID levels. Testing the unit for 48hrs inclusive of integrity checks, once completed, a twelve point QA check is performed and itemized configuration and QA report prepared. This service provides peace of mind. Your ReadyNAS is delivered ready to plug and store.

### Technical Support

The combined efforts of eAegis and NETGEAR help deliver a proactive and reactive after sales service to maintain the appropriate balance between the ReadyNAS availability and support cost efficiency. Thus ensuring your storage availability is always at a critically high level.

## Acknowledgments

It is hoped this guide has been of assistance in selecting which ReadyNAS product to Purchase. Perhaps the most important factor is planning for future requirements and not today's needs. Please do not hesitate to contact us to discuss your requirements; we are always on hand to assist you.

The "Which ReadyNAS guide" was written by Mohamed Mawji, Chief Operating Officer at eAegis. Who has over 32 years experience in the Computing and Storage sectors. Mohamed Mawji can be contacted via email – [mgm@eaegis.com](mailto:mgm@eaegis.com) .

All comments are most welcome and you are invited to send any comments to John Banks our Storage Manager at [banksj@eaegis.net](mailto:banksj@eaegis.net). All comments received will be subject to our confidentiality terms and not shared with third parties without prior permission.

We would like to thank Doug King who helped to cast a critical eye over the content and NETGEAR, Inc for all their help in making this guide possible by providing us with the graphics contained herein.

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## NETGEAR ReadyNAS RND4000 – COMPLETE OVERVIEW

### Robust Features Coupled with Easy Management

- Serves files easily
- Backs up data effortlessly
- Streams music and video quickly
- Shares printers with ease
- Works with Windows®, Mac®, and Linux®

ReadyNAS™ NV+ was designed specifically for home offices, small businesses and workgroups. Never before has there been available a cost-conscious Network Attached Storage (NAS) appliance packed with robust high-end server features, including Gigabit Ethernet, hardware RAID, system monitoring capabilities and built-in backup. ReadyNAS couples out of the box deployment and easy management with robust file serving and data redundancy.

### Easy Deployment and Management

With an easy web browser interface and setup wizard, ReadyNAS can be configured with minimal effort — saving you valuable time. Traditional file servers can take hours to configure and, even once up and running, don't have built-in system monitoring and email alerts. Available with ReadyNAS, automatic alerts give you the peace of mind that things are running smoothly because if trouble should arise, you will be notified.

### RAID

Supporting hardware accelerated RAID (Redundant Array of Independent Disks) levels 0, 1, 5 and ReadyNAS's own X-RAID™ technology, ReadyNAS ensures full data redundancy with protection against hardware failure — something previously only available in high end servers. If one drive fails, the data volumes can still be rebuilt with the remaining drives. Without RAID, once a failure occurs, you risk losing all of the data stored on the drive.

### X-RAID Technology

ReadyNAS's patent pending X-RAID technology automates the volume expansion for you as you scale from 1 HDD to 4 HDD. Most NAS devices on the market aren't future-proof. You can't add or replace disks for larger capacity. ReadyNAS allows you to start with one disk, and then add the additional drives over time, without reconfiguring the system and shuffling the data. Additionally, as disk capacity becomes larger and cheaper, you can replace all four disks, one-by-one, while X-RAID automatically manages the RAID details for you.

### Backup

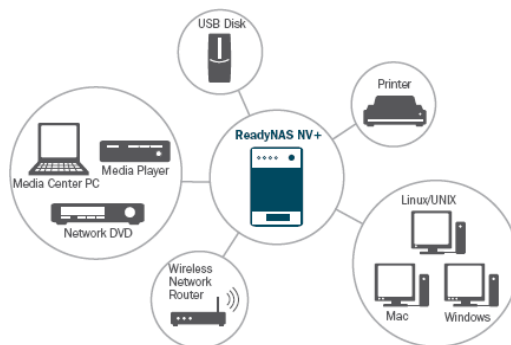
A sound backup strategy is important and relying on manually copying your important files is tedious and error-prone. With the help of EMC® Retrospect® backup and recovery software, you can set automatic backups of all of your network clients — whether they are Windows, Mac or Linux — to your ReadyNAS. Additionally, ReadyNAS includes an integrated backup manager that enables one-button backup from your NAS appliance to external USB HDD for offsite rotation, or to remote servers, if needed.

### File Serving and Media Streaming

ReadyNAS is a single centralized source for all of your digital data. The variety of digital devices and hard drives that currently house the data in your home and office can make locating a particular file quite arduous. ReadyNAS can bring all of that data together for fast and easy file serving to multiple clients simultaneously. If it's video or other high-definition media you are working with, you can use your ReadyNAS for streaming to multiple devices at the same time.

### Advanced System Design

The industrial design and ultra compact form factor of the ReadyNAS makes it perfect for any home office or small business. Standing only eight inches tall and five inches wide, it can fit in any entertainment center or on any desk without taking up much space or making much noise. ReadyNAS also offers low power consumption and a special energy-saving mode that allows you to automate startup and shutdown.



## NETGEAR ReadyNAS RND4000 – OVERALL SPECIFICATIONS

**General**

- IT3107 Network Storage Processor
- 4 Serial ATA channels
- Compatible with SATA and SATA I/HDD
- Hot swappable and lockable trays
- 10/100/1000 Ethernet
- LCD display
- 3 USB 2.0 ports
- 256MB PC2700 DDR-SDRAM SO-DIMM
- Embedded 64MB Flash Memory for OS
- Supports Windows, Mac, Linux/UNIX Clients
- DHCP server and print server
- Setup wizard and easy browser-based interface

**RAID**

- Hardware X-RAID single volume auto expansion
- Multiple volume support for RAID 0, 1, 5

**Volumes**

- Volume management
- Single volume auto expansion (X-RAID)
- Journalled file system
- User, group, and share-level quotas

**Network File Services**

- CIFS/SMB for Windows®
- AFP 3.1 for Mac OS 9/X
- NFS v2 / v3 for Linux and UNIX
- HTTP/S for web browsers
- FTP/S support

**Media Streaming**

- UPnP AV
- SlimServer
- Network DVD player compatible
- Windows MCE compatible

**Network Security**

- Selectable Share, User Domain/ADS modes
- Windows™ ACL
- Encrypted network logins
- Secure Socket Layer (SSL)

**Network Options**

- DHCP or static IP
- WINS, NTP

**System Management**

- Performance options
- Device status
- Email alerts and event logs
- SNMP

**Backup**

- Integrated Backup Manager
- Programmable backup button
- Backup to/from CIFS/NFS/FTP/HTTP & RSYNC
- Backup to/from USB disks
- Bundled backup software:  
EMC® Retrospect® Professional for Windows (5 users license)  
EMC® Retrospect® Desktop for Macintosh (5 users license)

**USB Device Supported**

- USB HDD and flash drives
- Printers
- UPS monitoring and auto shutdown
- Wireless network adapters

**Web Browsers Supported**

- Internet Explorer 6.0+
- Netscape Navigator 7.0+
- Opera 7.0+; Safari 1.22+
- Mozilla Firefox 1.03+

**Languages**

- Management UI: English, Japanese, Chinese, and German
- File Name: Unicode

**Electrical**

- Fanless server-rated AC power supply
- Input: 100-240 VAC, 50/60Hz

**Power Consumption**

- 55 W typical (with 4 x 250GB disks)
- Power saving mode

**Thermal**

- 92mm ball-bearing chassis cooling fan
- Fan failure alert

- High temperature email alert with auto-shutdown option

#### **Operating Environmental**

- 0° C-40° C
- 20-80% Humidity (non-condensing)
- FCC, UL, CE, C-tick, RoHS compliance

#### **Physical**

- Kensington® lock security hole
- Easy carry handle
- Dimension: 7.9 H x 5.2 W x 8.7 D (inch) / 200 H x 132 W x 222 D (mm)
- Weight: 10 pounds (4.6 Kg) without disks

#### **Optional Spare Parts**

- Lockable disk tray
- 92mm chassis fan
- AC power supply

#### **Package Contents**

- ReadyNAS NV+
- 4 Hard Disk Trays (No drives included)
- Getting Started Guide
- Warranty Card
- Power Cable
- Ethernet Cable
- ReadyNAS Installation CD
  - ReadyNAS Discovery Utility
  - 5-Client EMC Retrospect Professional for Windows
  - 5 Client EMC Retrospect Desktop for Macintosh
- 16 Screws for Hard Disk Installation

## NETGEAR ReadyNAS 1100 RNR4000 – COMPLETE OVERVIEW

### Ultra Efficient, Feature-Rich, Cost-Effective NAS

- Ideal for departments and workgroups
- Backs up and archives data
- Supports RAID 0, 1, 5, X-RAID™
- Integrates into Active Directory
- Designed for easy servicing
- Remarkably energy efficient

ReadyNAS™ 1100 was designed specifically for small businesses and workgroups. The ultra efficient, rack-mountable, 1U Network Attached Storage (NAS) appliance is cost-effective as well as rich in features, including Gigabit Ethernet, hardware RAID, continuous system monitoring and effortless Active Directory integration. With ReadyNAS, there is no additional software to install because the operating system is embedded.

### Backup and Data Archiving

A sound information lifecycle management strategy includes backup and data protection as well as archiving and long-term retention. ReadyNAS can cost-effectively help you with each. ReadyNAS 1100 fits into a standard datacenter rack, providing a perfect backup target. With the help of EMC® Retrospect® backup and recovery software, included with ReadyNAS, you can set automatic backups of all of your network clients – whether they are Windows®, Mac or Linux. Additionally, ReadyNAS includes an integrated backup manager that enables one-button or scheduled backup from your appliance to both external USB HDD and remote servers for offsite rotation. ReadyNAS can also be used for long-term storage and archiving. Whether you are looking to comply with Sarbanes-Oxley, Gramm-Leach-Bliley, HIPAA, or you simply want to exercise solid business practices.

### Hardware RAID

Supporting hardware accelerated RAID (Redundant Array of Independent Disks); ReadyNAS ensures full data redundancy with protection against hardware failure. If one drive fails, the data volumes can still be rebuilt with the remaining drives. ReadyNAS can be configured for levels 0, 1, 5 or ReadyNAS's own X-RAID™ technology. X-RAID automates the volume expansion for you when scaling from 1 HDD to 4 HDD. Start with one disk, and then add additional disks, or even upgrade to higher capacity disks later, without shuffling the data and reconfiguring the system.

### Active Directory Integration

The Sarbanes-Oxley Act and other regulations have driven company-wide policy enforcement of resource and data access. Windows Active Directory centrally organizes company credentials and permissions, and when adding devices to the infrastructure, seamless integration is very important. ReadyNAS can be integrated into Active Directory in a few keystrokes, allowing you to take full advantage of the existing permissions. If you have not deployed Active Directory, ReadyNAS can be setup with its own share and user /group permissions.

### Rapid System Board Replacement Module

In addition to the ground-breaking X-RAID™ technology, the ReadyNAS 1100 has pushed the envelop even further with the introduction of the X-Change® S10 – Rapid System Board replacement module. ReadyNAS has cleverly packaged the system board, power supply and cooling fans into a discrete module. X-Change facilitates the servicing of non HDD related failures and literally takes just moments to swap out, saving man hours and minimizing downtime when it is most critical.

### Efficient System Design

The rack-mountable 1U form factor of the ReadyNAS 1100 has a remarkable 12 inch depth that facilitates back-to-back arrangements. Its modular design —the system board module separates from the drive bay chassis—makes it very easy to service. The unique NAS specific processor, coupled with smart power management options, including sequence drive spin up, and idle drive spin-down, result in less than a 80 Watt power consumption.

## NETGEAR ReadyNAS 1100 RNR4000 – OVERALL SPECIFICATIONS

### General

- IT1004 Network Storage Processor
- 4 Serial ATA channels
- Compatible with SATA and SATAII HDD
- Hot swappable and lockable trays
- Dual 10/100/1000 Ethernet
- 3 USB 2.0 ports
- 512MB PC2700 DDR-SDRAM SO-DIMM
- Embedded 64 MB Flash Memory for OS
- Supports Windows®, Mac, Linux/UNIX clients
- DHCP server and print server
- Setup wizard and easy browser-based interface

### RAID

- Hardware X-RAID single volume auto expansion
- Multiple volume support for RAID 1, 2, 5
- Background sync and Smart Sync resume

### Volumes

- Volume management
- Single volume auto expansion (X-RAID)
- Journal file system
- Snapshot with scheduling
- User, group, and share-level quotas

### Network File Services

- CIFS/SMB for Windows®
- AFP 3.1 for Mac OS 9/X
- NFS v2 / v3 for Linux and UNIX
- HTTP/S for web browsers
- FTP/S support

### Network Security

- Selectable Share, User, Domain/ADS modes
- Windows ACL
- Encrypted network logins
- Secure Socket Layer (SSL)

### Network Options

- DHCP or static IP
- WINS, NTP

### System Management

- Performance options
- Device status
- Email alerts and event logs

- SNMP
- RAIDar™ discovery and monitoring agent
- FrontView™ setup wizard and advanced control

### Backup

- Integrated Backup Manager
- Programmable backup button
- Full and incremental backups
- Backup to/from CIFS/NFS/FTP/HTTP & RSYNC
- Backup to/from USB disks
- Supports syncing between multiple NAS devices
- Full backup file logs
- Bundled backup software
- EMC® Retrospect® Professional for Windows (5 users license)
- EMC® Retrospect® Desktop for Macintosh® (5 users license)

### USB Device Supported

- USB HDD and flash drives
- Support for FAT32, Ext2, Ext3, and NTFS (read-only)
- Printers
- UPS monitoring and auto shutdown

### Languages

- Management UI: English, Japanese, Chinese, and German
- File Name: Unicode

### Web Browsers Supported

- Internet Explorer 6.0+
- Netscape Navigator 7.0+
- Opera 7.0+; Safari 1.22+
- Mozilla Firefox 1.03+

### Electrical

- fanless server-rated AC power supply
- Input: 100-240 VAC, 50/60Hz

### Power Consumption

- <80 W typical (with 4 x 750GB disks)
- Power saving mode

### Thermal

- 3 Dual 40 mm ball-bearing chassis cooling fans

- Fan failure alert
- High temperature email alert with auto-shutdown option

#### **Operating Environmental**

- 0° C-40° C
- Humidity: 20-80% (non-condensing)
- FCC, UL, CE, C-tick, RoHS compliance

#### **Physical**

- Form Factor: 1U rack-mount
- Dimension: 1.7 H x 16.9 W x 12.5 D (inch) / 200 H x 132 W x 222 D (mm)
- Weight: 18 pounds (8.2 Kg) without disks

#### **Optional Spare Parts**

- Lockable disk tray
- Dual 40 mm ball-bearing chassis cooling fan
- AC power supply
- X-Change® S10 spare system module

#### **Package Contents**

- ReadyNAS 1100
- 4 Hard Disk Trays (with 500GB HDD)
- Getting Started Guide
- Warranty Card
- Power Cable
- Ethernet Cable
- ReadyNAS Installation CD
  - ReadyNAS Discovery Utility
  - 5-Client EMC Retrospect Professional for Windows
  - 5 Client EMC Retrospect Desktop for Macintosh

## SEAGATE Drives recommended by eAegis for integration purposes

The **ReadyNAS NV+** drives we have used and are highly recommended by us for integration purposes are listed below.

**Model: ST3250620AS**

**Name: Seagate Barracuda 7200.10 SATA 3.0Gb/s 250-GB Hard Drive**

**Classification: Desktop Drive**

<b>Specifications</b>	<b>250 GB</b>
Model Number	ST3250620AS
Interface	SATA 3.0Gb/s
Cache	16 Mbytes
Capacity	250 GB
Guaranteed Sectors	488,397,168
<b>PHYSICAL</b>	
Height (max)	26.1 mm (1.028 inches)
Width (max)	101.6 mm (4.010 inches)
Length (max)	146.99 mm (5.787 inches)
Weight (typical)	600 grams (1.32 pounds)
<b>PERFORMANCE</b>	
Spindle Speed	7,200 rpm
Average latency	4.16 msec
Random read seek time	<8.5 msec
Random write seek time	<10.0 msec
<b>RELIABILITY</b>	
MTBF	700,000 hours
Annual Failure Rate	0.34 %
<b>POWER</b>	
Maximum start current, DC	2.80 amps

The model drives above are used by NETGEAR for the NETGEAR ReadyNAS NV+ RND4425

**Model: ST3500630NS****Name: Seagate Barracuda® ES SATA 3.0Gb/s 500-GB Hard Drive****Classification: Server & Enterprise Storage**

The Seagate® Barracuda® ES enterprise hard drive is the industry's most reliable, highest capacity 7200-RPM hard drive for 24 x 7, multidrive, business-critical applications. The Barracuda ES hard drive is built with perpendicular recording technology for maximum capacity, reliability and cost-effectiveness.

<b>Specifications</b>	<b>500 GB</b>	<b>ENVIRONMENT</b>	
Model Number	ST3500630NS	<b>Ambient Temperature</b>	
Interface	SATA 3.0Gb/s	Operating	5 to 55 degrees C
Cache	16 MBytes	Nonoperating	-40 to 70 degrees C
Capacity	500 GB	Maximum operating temperature change	20 degrees C per hour
Guaranteed Sectors	976,773,168	Maximum nonoperating temperature change	30 degrees C per hour
Number of pins on the I/O connector	22	Maximum operating case temperature	69 degrees C
<b>PHYSICAL</b>		<b>Relative Humidity</b>	
Height (max)	26.1 mm (1.028 inches)	Operating	5 to 90
Width (max)	101.6 mm (4.000 inches)	Nonoperating	5 to 95
Length (max)	146.99 mm (5.787 inches)	Maximum allowable humidity change	30 per hour
Weight (typical)	635 grams (1.40 pounds)	<b>Altitude</b>	
<b>COMPLIANCE</b>		Operating altitude (min)	-60.96 meters (-200 feet)
European Union Restriction of Hazardous Substances	Y	Operating altitude (max)	3,048 meters (10,000 feet)
<b>PERFORMANCE</b>		Nonoperating altitude (min)	-60.96 meters (-200 feet)
Spindle Speed	7200 rpm	Nonoperating altitude (max)	12,192 meters (40,000 feet)
Native Command Queuing	Y	<b>Shock</b>	
Average latency	4.16 msec	Operating Shock (max)	63 Gs at 2 msec
Random read seek time	<8.50 msec	Nonoperating Shock (max)	300 Gs at 2 msec
Random write seek time	<10.0 msec	<b>Vibration</b>	
Maximum interface transfer rate	300 Mbytes/sec.	Operating vibration	0.25 Gs at 5-22 Hz
<b>RELIABILITY</b>		Operating vibration	0.50 Gs at 22-350 Hz
MTBF	1,200,000 hours	Operating vibration	0.25 Gs at 350-500 Hz
Annual Failure Rate	0.73 %	Nonoperating vibration	0.25 Gs at 5-22 Hz
Unrecoverable read errors	1 in 10 <sup>14</sup>	Nonoperating vibration	5.0 Gs at 22-350 Hz
<b>POWER</b>		Nonoperating vibration	1.0 Gs at 350-500 Hz
Average idle current	9.30 watts	<b>ACOUSTICS</b>	
Average seek power	12.60 watts	Acoustics (Idle Volume)	2.5 bels
Standby power	0.80 watts	Acoustics (Seek Volume)	3.2 bels
Sleep power	0.807 watts	The model drives above are used by NETGEAR and eAegis for the NETGEAR ReadyNAS NV+ RND4250 and RND4450	
Maximum start current, DC	2.80 amps		

**Model: ST3750640NS****Name: Seagate Barracuda® ES SATA 3.0Gb/s 750-GB Hard Drive****Classification: Server & Enterprise Storage**

The Seagate® Barracuda® ES enterprise hard drive is the industry's most reliable, highest capacity 7200-RPM hard drive for 24 x 7, multidrive, business-critical applications.

<b>Specifications</b>	<b>750 GB</b>	<b>Ambient Temperature</b>	
Model Number	ST3750640NS	Operating	5 to 55 degrees C
Interface	SATA 3.0Gb/s	Nonoperating	-40 to 70 degrees C
Cache	16 MBytes	Maximum operating temperature change	20 degrees C per hour
Capacity	750 GB	Maximum nonoperating temperature change	30 degrees C per hour
Guaranteed Sectors	1,465,149,168	Maximum operating case temperature	69 degrees C
<b>PHYSICAL</b>		<b>Relative Humidity</b>	
Height (max)	26.1 mm (1.028 inches)	Operating	5 to 90
Width (max)	101.6 mm (4.000 inches)	Nonoperating	5 to 95
Length (max)	146.99 mm (5.787 inches)	Maximum allowable humidity change	30 per hour
Weight (typical)	720 grams (1.59 pounds)	<b>Altitude</b>	
<b>COMPLIANCE</b>		Operating altitude (min)	-60.96 meters (-200 feet)
European Union Restriction of Hazardous Substances	Y	Operating altitude (max)	3,048 meters (10,000 feet)
<b>PERFORMANCE</b>		Nonoperating altitude (min)	-60.96 meters (-200 feet)
Spindle Speed	7200 rpm	Nonoperating altitude (max)	12,192 meters (40,000 feet)
Native Command Queuing	Y	<b>Shock</b>	
Average latency	4.16 msec	Operating Shock (max)	63 Gs at 2 msec
Random read seek time	8.50 msec	Nonoperating Shock (max)	300 Gs at 2 msec
Random write seek time	9.50 msec	<b>Vibration</b>	
Maximum interface transfer rate	300 Mbytes/sec.	Operating vibration	0.25 Gs at 5-22 Hz
<b>RELIABILITY</b>		Operating vibration	0.50 Gs at 22-350 Hz
MTBF	1,200,000 hours	Operating vibration	0.25 Gs at 350-500 Hz
Annual Failure Rate	0.73 %	Nonoperating vibration	0.25 Gs at 5-22 Hz
Unrecoverable read errors	1 in 10 <sup>14</sup>	Nonoperating vibration	5.0 Gs at 22-350 Hz
<b>POWER</b>		Nonoperating vibration	1.0 Gs at 350-500 Hz
Average idle current	9.30 watts	<b>ACOUSTICS</b>	
Average seek power	12.60 watts	Acoustics (Idle Volume)	2.7 bels
Standby power	0.80 watts	Acoustics (Seek Volume)	3.2 bels
Sleep power	0.807 watts	The model drives above are used by eAegis for the NETGEAR ReadyNAS NV+ RND4275 and RND4475 Models	
Maximum start current, DC	2.80 amps		
<b>ENVIRONMENT</b>			

## SEAGATE Drives recommended by eAegis for integration purposes

The **ReadyNAS 1100** drives we have used and are highly recommended by us for integration purposes are listed below.

### Model: ST3500630NS

#### Name: Seagate Barracuda® ES SATA 3.0Gb/s 500-GB Hard Drive

#### Classification: Server & Enterprise Storage

The Seagate® Barracuda® ES enterprise hard drive is the industry's most reliable, highest capacity 7200-RPM hard drive for 24 x 7, multidrive, business-critical applications. The Barracuda ES hard drive is built with perpendicular recording technology for maximum capacity, reliability and cost-effectiveness.

<b>Specifications</b>	<b>500 GB</b>	Standby power	0.80 watts
Model Number	ST3500630NS	Sleep power	0.807 watts
Interface	SATA 3.0Gb/s	Maximum start current, DC	2.80 amps
Cache	16 MBytes	<b>ENVIRONMENT</b>	
Capacity	500 GB	<b>Ambient Temperature</b>	
Guaranteed Sectors	976,773,168	Operating	5 to 55 degrees C
Number of pins on the I/O connector	22	Nonoperating	-40 to 70 degrees C
<b>PHYSICAL</b>		Maximum operating temperature change	20 degrees C per hour
Height (max)	26.1 mm (1.028 inches)	Maximum nonoperating temperature change	30 degrees C per hour
Width (max)	101.6 mm (4.000 inches)	Maximum operating case temperature	69 degrees C
Length (max)	146.99 mm (5.787 inches)	<b>Relative Humidity</b>	
Weight (typical)	635 grams (1.40 pounds)	Operating	5 to 90
<b>COMPLIANCE</b>		Nonoperating	5 to 95
European Union Restriction of Hazardous Substances	Y	Maximum allowable humidity change	30 per hour
<b>PERFORMANCE</b>		<b>Altitude</b>	
Spindle Speed	7200 rpm	Operating altitude (min)	-60.96 meters (-200 feet)
Native Command Queuing	Y	Operating altitude (max)	3,048 meters (10,000 feet)
Average latency	4.16 msec	Nonoperating altitude (min)	-60.96 meters (-200 feet)
Random read seek time	<8.50 msec	Nonoperating altitude (max)	12,192 meters (40,000 feet)
Random write seek time	<10.0 msec	<b>Shock</b>	
Maximum interface transfer rate	300 Mbytes/sec.	Operating Shock (max)	63 Gs at 2 msec
<b>RELIABILITY</b>		Nonoperating Shock (max)	300 Gs at 2 msec
MTBF	1,200,000 hours	<b>Vibration</b>	
Annual Failure Rate	0.73 %	Operating vibration	0.25 Gs at 5-22 Hz
Unrecoverable read errors	1 in 10 <sup>14</sup>	Operating vibration	0.50 Gs at 22-350 Hz
<b>POWER</b>		Operating vibration	0.25 Gs at 350-500 Hz
Average idle current	9.30 watts	Nonoperating vibration	0.25 Gs at 5-22 Hz
Average seek power	12.60 watts		

Nonoperating vibration 5.0 Gs at 22-350 Hz  
Nonoperating vibration 1.0 Gs at 350-500 Hz

Acoustics (Idle Volume) 2.5 bels  
Acoustics (Seek Volume) 3.2 bels

**ACOUSTICS**

The model drives above are used by NETGEAR and eAegis for the NETGEAR ReadyNAS 1100 - RNR4450

**Model: ST3750640NS****Name: Seagate Barracuda® ES SATA 3.0Gb/s 750-GB Hard Drive****Classification: Server & Enterprise Storage**

The Seagate® Barracuda® ES enterprise hard drive is the industry's most reliable, highest capacity 7200-RPM hard drive for 24 x 7, multidrive, business-critical applications. The Barracuda ES hard drive is built with perpendicular recording technology for maximum capacity, reliability and cost-effectiveness.

<b>Specifications</b>	<b>750 GB</b>	<b>Ambient Temperature</b>	
Model Number	ST3750640NS	Operating	5 to 55 degrees C
Interface	SATA 3.0Gb/s	Nonoperating	-40 to 70 degrees C
Cache	16 MBytes	Maximum operating temperature change	20 degrees C per hour
Capacity	750 GB	Maximum nonoperating temperature change	30 degrees C per hour
Guaranteed Sectors	1,465,149,168	Maximum operating case temperature	69 degrees C
<b>PHYSICAL</b>		<b>Relative Humidity</b>	
Height (max)	26.1 mm (1.028 inches)	Operating	5 to 90
Width (max)	101.6 mm (4.000 inches)	Nonoperating	5 to 95
Length (max)	146.99 mm (5.787 inches)	Maximum allowable humidity change	30 per hour
Weight (typical)	720 grams (1.59 pounds)	<b>Altitude</b>	
<b>COMPLIANCE</b>		Operating altitude (min)	-60.96 meters (-200 feet)
European Union Restriction of Hazardous Substances	Y	Operating altitude (max)	3,048 meters (10,000 feet)
<b>PERFORMANCE</b>		Nonoperating altitude (min)	-60.96 meters (-200 feet)
Spindle Speed	7200 rpm	Nonoperating altitude (max)	12,192 meters (40,000 feet)
Native Command Queuing	Y	<b>Shock</b>	
Average latency	4.16 msec	Operating Shock (max)	63 Gs at 2 msec
Random read seek time	8.50 msec	Nonoperating Shock (max)	300 Gs at 2 msec
Random write seek time	9.50 msec	<b>Vibration</b>	
Maximum interface transfer rate	300 Mbytes/sec.	Operating vibration	0.25 Gs at 5-22 Hz
<b>RELIABILITY</b>		Operating vibration	0.50 Gs at 22-350 Hz
MTBF	1,200,000 hours	Operating vibration	0.25 Gs at 350-500 Hz
Annual Failure Rate	0.73 %	Nonoperating vibration	0.25 Gs at 5-22 Hz
Unrecoverable read errors	1 in 10 <sup>14</sup>	Nonoperating vibration	5.0 Gs at 22-350 Hz
<b>POWER</b>		Nonoperating vibration	1.0 Gs at 350-500 Hz
Average idle current	9.30 watts	<b>ACOUSTICS</b>	
Average seek power	12.60 watts	Acoustics (Idle Volume)	2.7 bels
Standby power	0.80 watts	Acoustics (Seek Volume)	3.2 bels
Sleep power	0.807 watts	The model drives above are used by NETGEAR and eAegis for the NETGEAR ReadyNAS 1100 - RNR4475 Mode	
Maximum start current, DC	2.80 amps		
<b>ENVIRONMENT</b>			