

WHITE PAPER

UPS and NAS devices



THE GLOBAL SPECIALIST IN ELECTRICAL AND
DIGITAL BUILDING INFRASTRUCTURES

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WHAT IS A NAS ?



A NAS (Network Attached Storage) device is an intelligent data storage device. It connects and can be accessed directly via a Wi-Fi or wired network and does not require a computer for operation. NAS devices contain a processor (CPU, Central Processing Unit) and an operating system so they can run applications and provide the intelligence needed to easily share files by people authorised to access them.

The embedded operating system allows the user to specify access rights to folders and files, making them available on different platforms.

A NAS contains several hard disks for storing data.

Typically, a NAS allows for the eventual removal and addition of disks 'hot', i.e. without the need to disable the drive.

One of the most important advantages of NAS is that it centralises data storage in a single, highly specialised device that is accessible to all devices connected to the network.

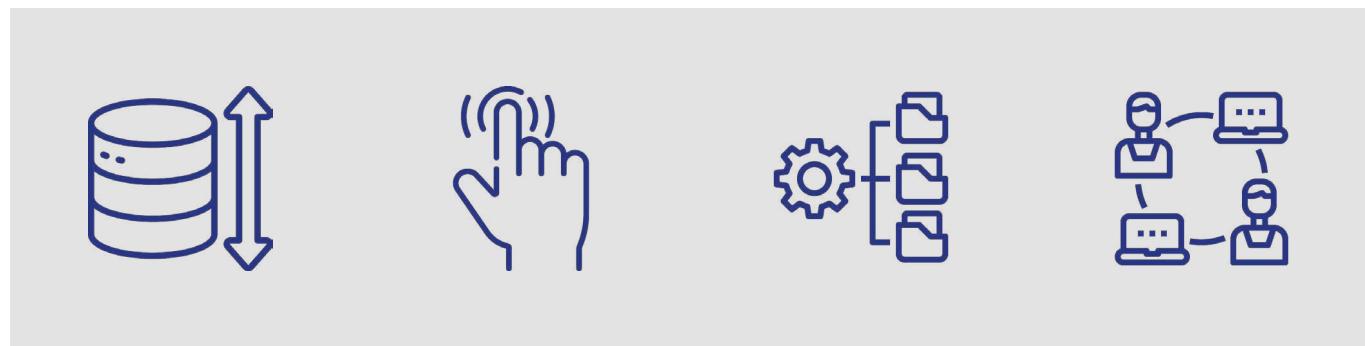
On the other hand, a possible disadvantage in opting for a NAS solution could be the enormous amount of data flowing over the network.

NAS is therefore suitable for environments where convenience and management flexibility are important and performance is a secondary factor.

One of the main features of a NAS device is that it can be easily accessed by multiple people, multiple computers, mobile devices or even remotely.

The NAS can be connected directly to a computer. This is what most of us do at home when we need more storage space for our computer: most often we use a USB cable to connect a hard disk or SSD drive to the computer's USB port.

Otherwise, the NAS device is accessed via a network, such as the local network of an office or home, which can be a wired Ethernet network or a WiFi network.



Picture 1: NAS features

NAS FEATURES

To support the variety of ways in which network-attached storage is to be used, NAS devices have several components built into their architectures.

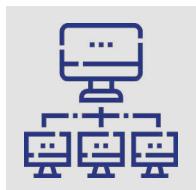
STORAGE



NAS offers the possibility of sharing files and backing them up in a centralized and automatic manner. Most popular NAS devices for the home office, small business or corporate workgroup contain between two and five hard disks. Although multiple hard disks clearly offer greater capacity than a single hard disk, they can also provide redundancy and faster file access and storage times.

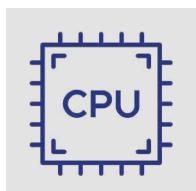
NAS devices typically utilize a special category of 3.5-inch hard disks, which can meet the requirements of a constantly running device.

NETWORK CONNECTION



This is the situation in which the NAS device is connected to one or more computers whose users can also access the content on the NAS simultaneously, subject to authorization. Connection to the network can be via Ethernet cable (wired) or Wi-Fi. Although many NAS devices contain USB ports, these ports are not used to connect the NAS device to the computer: the USB ports are used to connect other devices to the NAS device, either for charging or backing up the NAS device or for transferring other data.

COMPUTER/CPU



NAS devices contain a CPU (central processing unit) that requires intelligence and computing power to manage the file system, read and write operations, run applications, process multimedia files (such as video), manage multiple users and possibly integrate with the cloud.

NAS OR CLOUD ?

Having additional storage space accessible wirelessly is useful for both home and business applications, but choosing the right equipment involves a learning curve. For homes and small businesses, choosing between a NAS and the cloud can be a difficult decision.

Let's analyze why one should be preferred over the other.

PROS AND CONS OF A NAS

NAS is a data storage device that distributes information to computers on a network. In most cases, it is pre-packaged computer equipment, although it can be built.

After purchasing the NAS and disk drives, the configuration process is extremely simple. NAS vendors often create their own software to guide users through the configuration process, so that users only need to plug in the power cable, Ethernet and follow the instructions.

Compared to the cloud, NAS can score points for its speed. Large files can usually be opened faster in the local network than via the Internet connection (at least via the Ethernet cable).

Companies operating a local server may be interested in using NAS as a storage space for data, for instance for business applications such as ERP and CRM. In such cases, however, it must be considered whether a cloud-based solution might not be the most reliable for security and availability reasons. Should it be too demanding or should the business application not be compatible with the cloud, then it is entirely legitimate to use a NAS to store server data.

The aspect of ownership of the storage is also important: in the case of storage via NAS, data is stored in a space owned by the user (consumer who has installed the NAS at home or entrepreneur who has adopted it for his office/SME). On the contrary, data on the cloud are stored in a virtual space and third-party servers: this detail should not be overlooked, especially when making assessments in terms of cyber security.



NAS OR CLOUD ?

PRO AND CONS OF THE CLOUD

The biggest advantage that the cloud brings to everyday business is that documents are available wherever there is an internet connection, without the need to establish a potentially risky connection to the company network from outside, as is the case with a NAS.

Flexibility is one of the added values that cloud storage brings to everyday business.

Storage capacity and the number of users can be easily increased or reduced by adjusting current subscriptions.

Documents can be shared within the team, which prevents multiple versions of the same text from circulating; in addition, mailboxes can be relieved by only including links to documents in e-mails instead of attachments.

Online storage also has several advantages in terms of data protection and security: for instance, documents deleted by mistake can be recovered within a certain time frame.

In the case of a ransomware attack, companies can restore the latest version of documents before encryption.

Applying the same security standards to a NAS means investing time in maintenance and building up the relevant know-how. The cloud offering, on the other hand, includes practically all these aspects.

	NAS	CLOUD
Simple configuration	■ ■ ■ ■	■ ■
Fast data retrieval	■ ■ ■ ■	■ ■ ■
Reliability	■ ■	■ ■ ■ ■
Affordability	■ ■	■ ■ ■ ■
Flexibility	■ ■ ■ ■	■ ■ ■
Cyber security	■ ■ ■ ■	■ ■

Picture 2: Comparison between NAS and cloud.

NAS APPLICATIONS

In addition to offering the ability to share files and back them up in a centralized and automatic manner, NAS also allows remote access (to upload or download files when one is not physically near the NAS), autonomous management of any synchronization with cloud services, the ability to act as media center devices, allowing the user to play their files directly from PCs, smartphones, tablets, consoles, smart TVs, etc., and even act as 'download stations' (i.e. offering the ability to download new files without having to use a computer). In addition, NAS can also be used to watch and record videos transmitted in real time by IP cameras, create a small Internet site without the need for external hosting and watch and record TV channels.

For a more detailed overview of specific NAS applications in general, but all the more so if information on specific models is needed, it is always recommended to analyze specialized documentation and/or contact the NAS manufacturers themselves.



WHY NAS + UPS ?

The installation and use of a NAS system in home or office environments is primarily based on the need for greater security of one's data, but it is important to remember that a power failure is one of the most common incidents that can occur. Suffice it to say that the probability of a power failure is higher than that of a disk failure with no less damaging consequences. NAS systems must therefore be protected by an uninterruptible power supply (UPS) to guarantee data access in network environments even in the event of a blackout.

The UPS is the ideal and specially designed device to protect these important devices and keep them running even during power outages.

This is why an uninterruptible power supply should be an indispensable component of any security system. A UPS protects expensive equipment from voltage fluctuations and power failures that can occur during normal use and damage sensitive electronic components and cause data loss. The UPS ensures data transmission, guaranteeing a reliable and safe shutdown of equipment. Furthermore, depending on the configuration, a UPS can power devices for up to several hours to bridge a power outage, so that data can still be accessed via PCs or mobile devices. This is especially important for small businesses and freelancers who need continuous and secure access to their data.

For a NAS system, a power failure without the use of an uninterruptible power supply can also mean an immediate loss of data, even for short interruptions. This can occur particularly in RAID systems where read and write cycles are performed continuously. Short power failures typically cause the entire system to crash, resulting in data loss or damage, or even total disk failure.

In the worst case, the entire RAID system may be damaged resulting in the loss of all data. Intelligent UPSs that have a dedicated communication protocol for NAS systems, thanks to their protection against data loss in the event of a network failure, are able to provide adequate runtime to prevent the immediate shutdown of the NAS system, providing up to several hours of continuous access to stored data.

RAID is a storage technology used to organize data in storage space (or storage volumes). It balances data protection, system performance and storage space by determining how the storage system distributes data.

Many different ways of distributing data have been standardized in different RAID levels. Each RAID level offers a trade-off between data protection, system performance and storage space.

For instance, one RAID level may improve data protection, but reduce storage space. Another RAID level may increase storage space, but also reduce system performance.

HOW TO CONNECT A UPS TO A NAS DEVICE

In the event of a power failure, the NAS, when connected to a UPS with a dedicated protocol, will gradually interrupt all services to prevent data loss and initiate a safe system shutdown while the UPS battery is discharging. In some devices it is also possible to specify the amount of time before the NAS initiates the interruption of services when a power failure occurs.

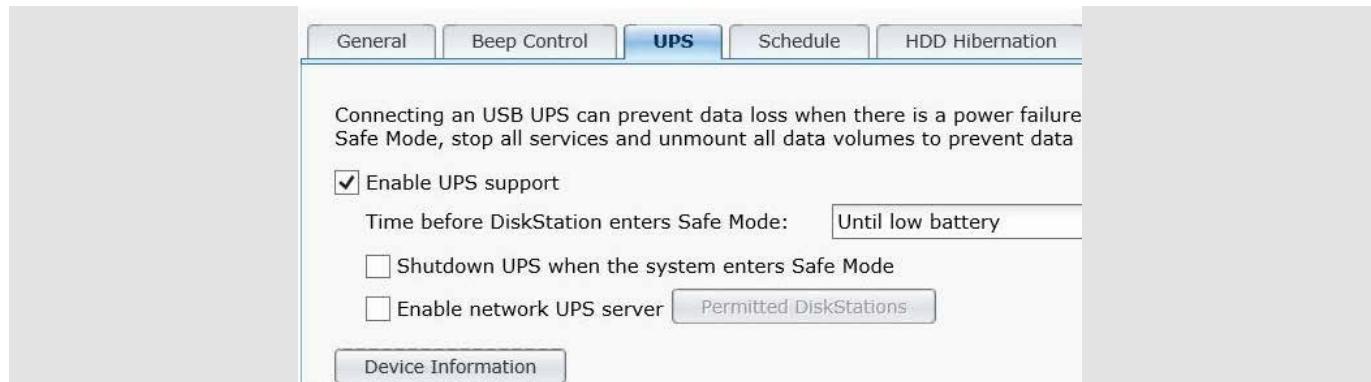
When power returns, the system will automatically reboot, restoring NAS services. On some devices this function must be enabled via the NAS system control menu.

However, the way in which each NAS system is enabled to control and support the UPS is different and varies from manufacturer to manufacturer; in any case we can summarize the main steps as below:

- Verify that the UPS model is compatible with NAS systems via the dedicated communication protocol present within the UPS.
- Connect and switch on the UPS. Connect the power cable of the NAS to one of the output sockets of the UPS and connect the two devices via USB cable using the appropriate slots.



- Access the NAS system, open the general settings section and enter the UPS management and control menu.



The screenshot shows a software interface for managing a UPS connected to a DiskStation. The top navigation bar includes tabs for General, Beep Control, UPS (which is highlighted in blue), Schedule, and HDD Hibernation. The main content area displays a message about preventing data loss during a power failure and stopping services. Below this, there are three configuration options with checkboxes:

- Enable UPS support

Time before DiskStation enters Safe Mode:
- Shutdown UPS when the system enters Safe Mode
- Enable network UPS server

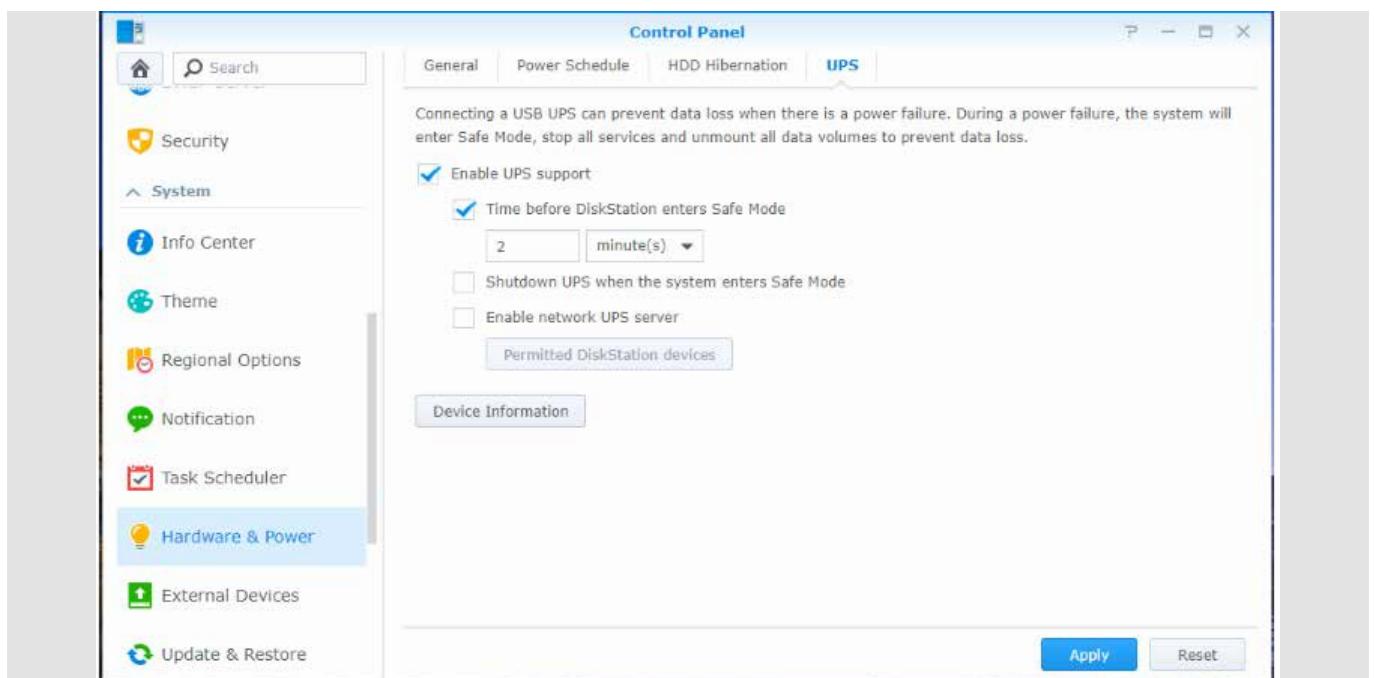
Permitted DiskStations:

At the bottom of the window, there is a "Device Information" button.



WHY NAS + UPS ?

- Enable UPS support, then you can select how long after the network power supply is turned off you want the NAS to enter safe mode.



- For some NAS models it is possible to receive some UPS statistics with estimated autonomy and percentage of battery capacity.

Get Info	
Item	Value
Manufacturer	CPS
Model	Value600EIGP
Status	Connected
Battery Charged	100%
Estimated Battery ...	2136 second(s)

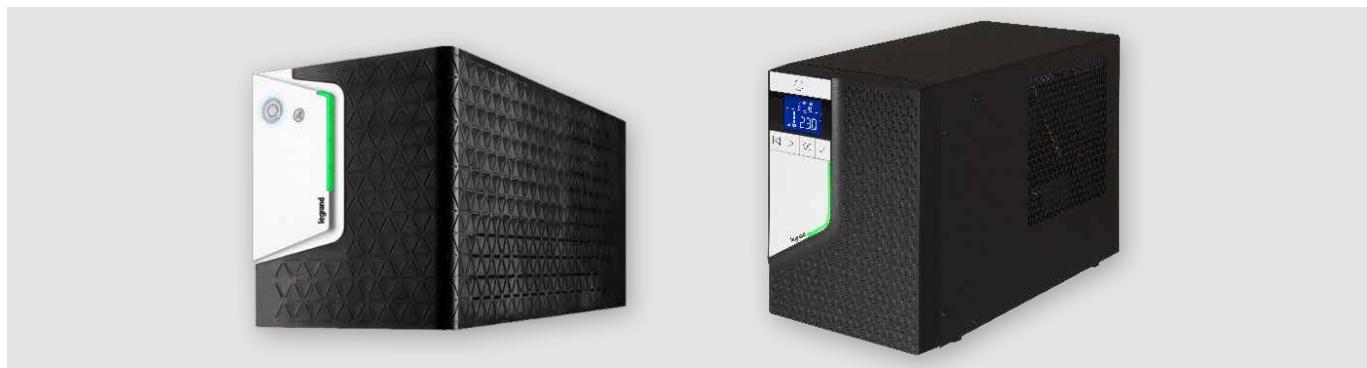
CONCLUSIONS: LEGRAND UPS AND NAS

Legrand is increasingly focused on guaranteeing continuity of service and the protection of sensitive devices such as NAS: this is the reason why it has introduced compatibility with the main available NAS systems into the Keor SP and Keor SPE Tower models, in order to prevent data loss and initiate system shutdown safely during the UPS battery discharge phase.

Keor SP UPS is a single-phase UPS with line interactive technology. It delivers a nominal power of 600-800-1000-1500-2000VA, is CPU-controlled and is internally equipped with maintenance-free, hermetic lead-acid batteries. Thanks to its sophisticated design, the Keor SP perfectly integrates into any home or work environment. In addition, the integrated AVR ensures a stable energy supply to the IT equipment for best performances and complete protection against overvoltage, overload and short circuit.

Keor SPE Tower UPS is a single-phase UPS with line interactive technology and pure sine wave output. It delivers a rated power of 675-1000-1500-2000-3000VA, is managed by a microprocessor and it allows self-diagnostics and cold start. The most intelligent and efficient network power protection is combined with a refined aesthetic design, making Keor SPE Tower suitable for any type of environment, domestic or professional. The presence of an electronic stabilizer (AVR) inside the UPS provides the connected loads with effective protection against any interference in the mains supply.

The LCD display and LED bar allow the display to be used easily and the UPS signals to be read quickly and intuitively.



Picture 3: Legrand Keor SP and Keor SPE Tower UPS.

To choose the correct size of UPS, it is necessary to know the active power of the device to be powered, i.e. the maximum power of the NAS expressed in Watts. It is advisable to consider a UPS with at least 50 per cent more power than the watts on the device in order to allow the completion of an entire backup, i.e. the maximum amount of time for which the UPS can supply power without a mains supply.

Notes



Notes





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