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ReadyNetGo .... News

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TIP(s) OF THE MONTH

1) **Software RAID** is used on multiple drives like hardware RAID but does not require a RAID controller card (usually the largest expense in setting up a hardware RAID).

Software RAID writes and reads mirrored information like hardware RAID 1 but performance can be impaired because the server's processor controls the input/output requests. In a hardware RAID 1 configuration, the controller card assumes this role and so the server experiences much faster performance. Therefore, software RAID should only be implemented if the server has abundant resources (fast processor and a large amount of RAM).

2) An important distinction to remember is that RAID controls hardware redundancy and eliminates downtime while **backups** preserve data. If you write corrupt or false information to your PC and you only have a RAID established, data will be unrecoverable. Only backups can restore uncorrupt data.

3) When implementing a RAID 1 or RAID 5, all drives must be the **same size**. If you have different size drives, the RAID will be based on the **smallest drive size**. In RAID 1 for example, if you have a 5 GB drive and a 7 GB drive, the RAID array will only recognize 5 GB for both drives.

Help Us Welcome Linda to Our Team

Linda Christianson came onboard in the beginning of March and is a welcome addition to our team. Linda has focused her career on PC and Network Management for the past 13 years most recently working at Fidelity Mutual Life Insurance Co. Linda, her husband Peter, and 16 month old daughter Hanna live near Media.

Is a RAID in your future?

One of the most important activities you can do on your computer is to back up your data frequently to external tape or disks. But while backing up your data is important, it will not prevent the downtime associated with a hard drive failure. Restores may take a half-day to two full days to reload the OS and programs before the server is up and running.

The question becomes, **can you afford this much lost time?**

For many people, access to information is too crucial to risk the potential downtime. That's where **RAID,** Redundant Array of Independent (or Inexpensive) Disks, comes in. Installing a RAID is worthwhile because it focuses on not only the reliability of data but the efficiency and performance of accessing data as well.

Key concepts to remember:

1. RAID is a storage solution that uses multiple hard drives that mimic one drive.
2. RAID was created to increase read/write efficiency and ensure data availability in case of a hard drive failure.
3. Different RAID levels were established to satisfy different applications and levels of performance.
4. If a drive fails, the potential downtime could outweigh the cost of implementing a RAID.

How is a hardware RAID established?

A RAID system consists of multiple hard drives and a controller card that performs read/write processes. By using multiple hard drives (generally 2 or 3), the goal of a RAID system is to increase performance and storage capacity while ensuring data reliability compared to using a single large drive.

RAID & Data Redundancy

How does a RAID differ from using one large drive or multiple hard drives not in a RAID?

A computer that has a RAID system in place can be configured so that if one hard drive fails, data is still accessible without user interruption. If, for example, a server has only one hard drive and the drive fails, no one will be able to access information on that hard drive (and according to Murphy's Law, this will happen during a crucial deadline). If the server had a RAID 1 or 5 configuration, redundant data would have been distributed over the hard drives so that when one of the hard drives failed, the other hard drive(s) would immediately compensate.

If a server has multiple hard drives not in a RAID, then redundant information is not saved. If a hard drive failed, all data would be lost. Even if a hard drive on the server is used as a backup device, if the hard drive fails at the end of the day, all data written since the last backup will be lost. Since a RAID writes redundant information simultaneously, user interruption and data loss is never affected unless in the extreme case where two hard drives fail simultaneously.

What types of RAID arrays are available?

Although there are multiple levels of RAID available, only **RAID 1** and **RAID 5** are important to remember. Both levels use multiple hard drives to mimic one large drive which makes read/write requests simple and more efficient than accessing information on two separate drives.

RAID 1 – also called mirroring. You will need two hard drives to configure a RAID 1 scenario because identical data is written to both drives concurrently. High performance controller cards that channel the input/output requests can speed up read operations because data is read from both drives at the same time.

The benefit of RAID 1: If one hard drive fails, the other drive has all of the information necessary to complete requests so no interruption in service will occur. Small file servers are geared for RAID 1 applications.

The downside to RAID 1: Actual storage capacity is 50% of hard drive capacity since one hard drive is dedicated to redundant information.

RAID 5 – also called distributed parity. You will need a minimum of three hard drives to configure a RAID 5 scenario. With RAID 5 and three hard drives, information is distributed across two drives and parity information is written to the third. (Parity information is a summation of the data, which in computer language is a series of 1's and 0's. When a drive fails, reconstructing the data is simple; the difference between the parity data and the unharmed data will equal the data on the inaccessible drive.)

The benefit of RAID 5: No drive is dedicated to store parity information. Instead, parity is randomly allocated so that if a hard drive fails only a portion of the data will need to be reconstructed. As with RAID 1, RAID 5 has fast read access because data is segmented across multiple drives and can be read concurrently. Database servers work well in a RAID 5 configuration.

The downside to RAID 5: Actual storage capacity = size(N-1). Ex: if you have 3 hard drives, since one drive is dedicated to parity, you will actually have only 2 drives for storage. Keep this in mind for the amount of data you will need to create and store. Write performance is slower with RAID 5 than with RAID 1 because two steps must occur: data must be written to the hard drives and parity information must be updated as well.