Storage Exercise

An array or 24, 1TB drives will have the following capacity and fault tolerance under the specified RAID configuration:

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|  | Capacity | Fault Tolerance |
| RAID 0 | 24TB – data is striped to provided improved performance. | None - 0 drive failure |
| RAID 1 | 1TB – uses mirroring without parity or striping. Data is duplicated to alternate physical drives. | Mirror - 23 drive failure |
| RAID 4 | 23TB – Data is striped, and all parity information is stored on a dedicated disk. | Parity - 1 drive failure |
| RAID 5 | 23TB – Data is striped along with a parity block that is distributed among the storage array. | Parity - 1 drive failure |
| RAID 6 | 22TB – this works like RAID 5 with an added parity entry, stored on a dedicated parity disk (like RAID 4), for double the fault tolerance. | Parity - 2 drive failures |
| RAID 10 | 12TB – this is a combination of RAID 0 + 1. The data is stiped and then the drives are mirrored. | Mirror - 12 drive failures if it is not a mirrored set. |

\*Blocks – smallest group of 0s and 1s that data can be segmented into.

\*Parity – compressed blocks.

\*Mirror – copying data from one drive to the next. No performance degradation during faults.

\*Striping – storing blocks on different physical drives.

File Server RAID Implementation:

File servers need to be readily available and recoverable in the event of a failure. Assuming that speed is not as desired as capacity, I would use RAID 6 because only two of the drives will be used for recovery therefore giving access to all other drives for storage. File Servers generally value space economy over speed: not to dismiss speed as an important factor. RAID 6 provides a good balance with speed and maximum storage space.

For a database server, IO transactions are a major aspect of configuration and those transactions need to be as fast as possible. I would use RAID 10, assuming that the server would be required to perform a huge number of transactions on a daily basis. RAID 10 gives the best performance while providing great fault tolerance that does not result in any performance degradation.