Uncle Billy's NAS Recommendations

Base NAS System

UGREEN NASes

I've looked over a number of brands, and I think UGREEN has a good balance of cost, features, and open compatibility for a general-purpose home NAS user.

Both of the systems below are basically the same, with the differences called on on each sub-bullet. Each system EXCLUDES storage, which you pick and choose separately. I will cover those options in the next section. Here are the shared features between the two options:

- 4 hot-swappable hard drive bays
  - Allows removing a dead/dying drive without having to disassemble the case
  - Allows future potential for hot-swapping a single drive for data transfer to an offline / cold storage disk
- Up to 30TB per disk, total of 120TB in a 4-disk RAID configuration
  - If reserving the 4th bay for cold-storage, max would be 60TB
- Dual NVME SSD bays (Up to 8TB each, would be 8TB in a RAID mirrored configuration)
  - Allows you to put ultra-fast caching storage on the NAS for faster network transfers, and potential for over-the-network video editing
- Dual Network Ports
  - 1x 2.5G Ethernet
  - 1x 10G Ethernet
- 128GB Flash Memory (used for NAS operating system)
- Comes with "personal cloud" software for remote access, including mobile phone photo/video backup
- 4K HDMI port
  - Allows you to use it as a media center on your TV. However I think using apps like Plex of Jellyfin on your existing media box would probably be a better integrated user experience.
- Supports "Docker" containers for self-hosting of add-on applications like:
  - Plex or Jellyfin ("Netflix" for your home videos, backed-up DVDs)
  - Nextcloud (Google Drive / iCloud replacement)
  - HomeAssistant (Home automation hub with wide vendor-agnostic integration compatibility)

    - Frigate (Security camera DVR system with object detection)
    - Wordpress (Website hosting)
    - Bookstack (Documentation hosting. The software hosting this website)

Choose between the following:

- UGREEN NASync DXP4800 Plus (~$620)
    - Intel Pentium Gold 8505 Processor
    - Expandable to 64GB RAM (ability to run more Docker apps)
- UGREEN NASync DXP4800 Pro (~$663)
    - Intel® Core™ i3-1315U Processor (Faster on multi-core workloads, ie, when using multiple server apps on your NAS)
    - Expandable to 96GB RAM (ability to run more Docker apps)

SATA Hard Drive Storage

I would recommend buying 3 matching drives of any of the following options. This will allow you to configure your NAS in a RAID5 array which is capable of expanding storage in the future by adding one more drive in the 4th bay. RAID5 combines 2 drives of X capacity into usable storage, and uses the 3rd drive for "parity" for redundancy and data recovery in case any of the 3 drives fail. Adding a 4th drive would add X more capacity to that array.

When buying drives for a RAID array, you should always avoid SMR (Shingled Magnetic Recording) drives, and look for CMR (Conventional Magnetic Recording) drives instead. This is important as SMR takes far longer to write data to the drive as it requires multiple passes over the same cylinder of the disk platter to ensure data integrity from the previous write. CMR requires only one pass.

- 3x 4TB (8TB total in RAID5) ~$114 ea: https://www.amazon.com/Western-Digital-WD-Internal-Drive/dp/B0G5YDXKS7/
- 3x 6TB (12TB total in RAID5) ~$205 ea: https://www.amazon.com/Red-Plus-Internal-Hard-Drive/dp/B08L3FSTX4/
- 3x 8TB (16TB total in RAID5) ~$250 ea: https://www.amazon.com/Seagate-ST8000VN002-5400-Hard-Drive/dp/B0BXGGD69P/
- 3x 10TB (20TB total in RAID5) ~$250 ea: https://www.amazon.com/Western-Digital-10TB-Internal-Drive/dp/B0F4R3YCL6/
- 3x 14TB (28TB total in RAID5) ~$350 ea: https://www.amazon.com/Seagate-IronWolf-14TB-Internal-Drive/dp/B07H7CW4YT/

All of the above *should* be new, never used items. You might be able to shop around and find better deals on "renewed" items, which in most cases are either just returned, unused items that can't be sold as new, or are drives with minimal usage. I've got 4 renewed drives I've been running

in my home server for ~6 years without issue, so they can be a good deal. Whatever you buy, just avoid SMR and make sure it mentions CMR specifically (you might have to look up specs elsewhere). Also, you will see RPM speeds listed. Generally, higher RPM speeds translate to faster small-file transfer performance, however higher RPMs usually consume more power.

NVME SSD Storage

This is completely optional, as the SSDs basically act as extra-fast flash storage and as a caching layer between your networked computer and your SATA RAID array. This can be useful when uploading large amounts of data like 4K video, as well as potentially doing editing of video footage directly on the NAS. If you are interested in this at a future date, let me know and I can spec out SSDs for this purpose. FWIW, SSD prices have been climbing over the past 6-12 months due to the high demand from AI datacenters. It's probably wise to hold off on this for now unless you suddenly change your mind on your expected use-case.

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