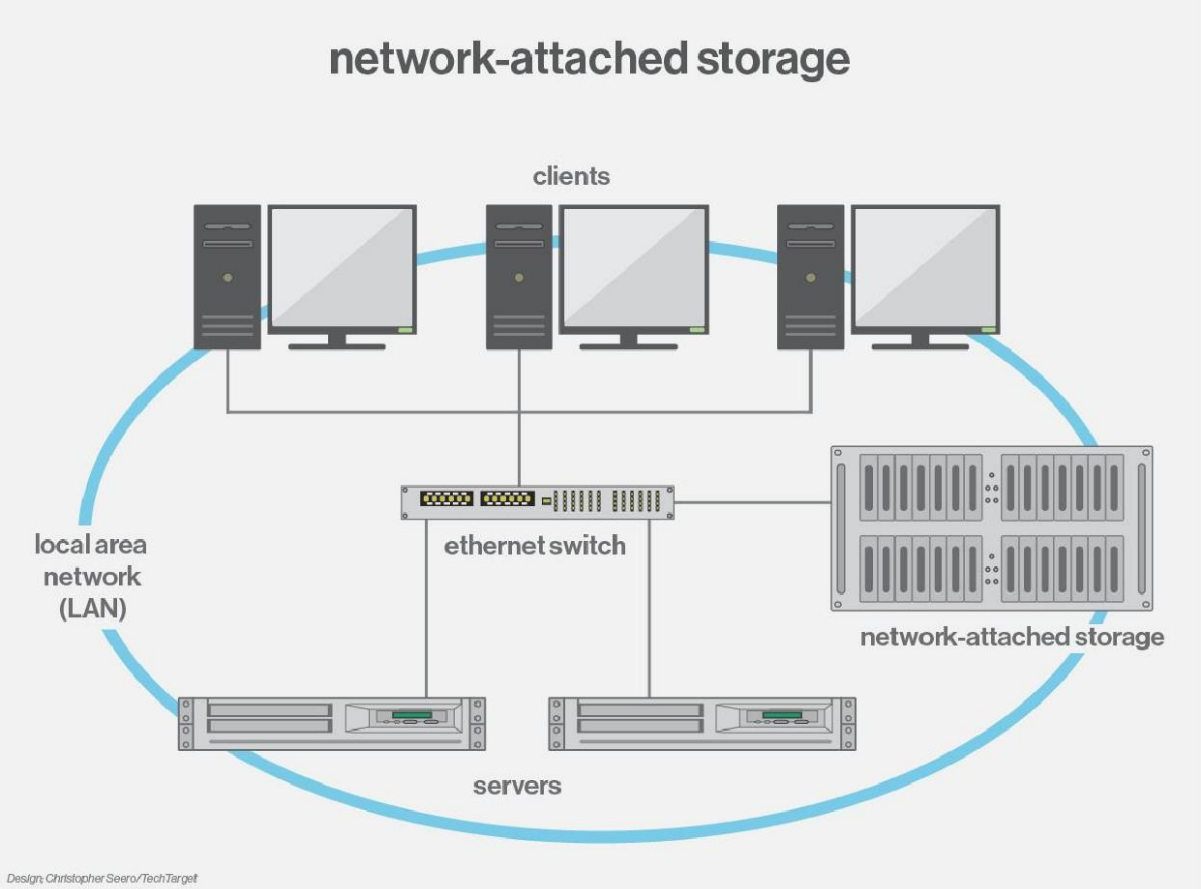
SYSTEM ANALYSIS

1 Network attached storage

Network-attached storage (NAS) is a type of dedicated file storage device that provides local-area network local area network (LAN) nodes with file-based shared storage through a standard Ethernet connection. NAS devices, which typically do not have a keyboard or display, are configured and managed with a browser-based utility program. Each NAS resides on the LAN as an independent network node and has its own IP address .An important benefit of NAS is its ability to provide multiple clients on the network with access to the same files. Prior to NAS, enterprises typically had hundreds or even thousands of discrete file servers that had to be separately configured and maintained.
Today, when more storage capacity is required, NAS appliances can simply be outfitted with larger disks or clustered together to provide both vertical scalability and horizontal scalability. Many NAS vendors partner with cloud storage providers to provide customers with an extra layer of redundancy for backing up files. In the home, NASes are often used for storing and serving multimedia files and for automated backups. Many smart homes rely on NAS to provide centralized storage for smart TVs, security systems and other Internet of Things (IoT) components in the home.

In the enterprise, a NAS array can be used as a backup target for archiving and disaster recovery. If a NAS device has a server mode, it can also function as an email, multimedia, database or print server for a small business. Some higher-end NAS products can hold enough disks to support RAID, a storage technology that turns multiple hard disks into one logical unit in order to provide better performance times, high availability and redundancy.



1.1 NAS product categories

NAS devices are grouped in three broad categories based on the number of drives, drive support, drive capacity and scalability.

- **High-end or enterprise NAS:** The high end of the market is driven by businesses that need to store huge amounts of files, including virtual machine (VM) images. High-end NAS provides rapid access and NAS clustering capabilities.
- **Midmarket NAS:** This end of the market can accommodate businesses that require several hundred terabytes of data. Midmarket NAS devices cannot be clustered, however, which can create file-system siloes when multiple NAS devices are required.
- **Low-end or desktop NAS:** The low end of the market is aimed at small businesses and home users who require local shared storage. Increasingly, this market is shifting toward a cloud NAS model.

1.2 Benefits of NAS

- NAS devices typically leverage existing IP networks for connectivity, enabling companies to reduce the price of entry for access to shared storage.
- The RAID and clustering capabilities inherent to modern enterprise NAS

devices offer greatly improved availability when compared with traditional direct attached storage.

- Because NAS devices control the file system, they offer increased flexibility when using advanced storage functionality such as snapshots.
- With 10GE connectivity, NAS devices can offer performance on par with many currently installed fiber channel SANs.

1.3 Creating a NAS solution

NAS is a common storage infrastructure offering in data centers worldwide. Eastern Computer has assisted many of our customers in justifying, designing, and implementing enterprise NAS solutions – we can do the same for you! Along the way, we'll work with you to develop a solution that meets your needs, allowing you to:

- Lower acquisition and management costs
- Meet performance and availability requirements
- Handle ever increasing annual storage growth with minimal to no impact to your business
- Minimize, or even eliminate, the impact of backup windows
- Deliver operational and disaster recovery.

2 RaspberryPi

The Raspberry Pi is a low cost, **credit-card sized computer** that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games. What's more, the RaspberryPi has the ability to interact with the outside world, and has been used in a wide array of digital maker projects, from music machines and parent detectors to weather stations and tweeting birdhouses with infra-red cameras. We want to see the Raspberry Pi being used by kids all over the world to learn to program and understand how computers work.

2.1 Is the Raspberry Pi open source?

The Raspberry Pi operates in the open source ecosystem: it runs Linux (a variety of distributions), and its main supported operating system, Pi OS, is open source and runs a suite of open source software. The Raspberry Pi Foundation contributes to the Linux kernel and various other open source projects as well as releasing much of its own software as open source.

The Raspberry Pi's schematics are regularly released as documentation, but the board is not open hardware.

The Raspberry Pi Foundation relies on income from the sale of Raspberry Pi units to do its charitable work in the education sector.

2.2 What can you do with a Raspberry Pi?

Some people buy a Raspberry Pi to learn to code, and people who can already code use the Pi to learn to code electronics for physical projects. The Raspberry Pi can open opportunities for you to create your own home automation projects, which is popular among people in the open source community because it puts you in control, rather than using a proprietary closed system.

2.3 Raspberry Pi OS

Your Raspberry Pi needs an operating system to work. This is it. Raspberry Pi OS (previously called Raspbian) is our official supported operating system.

2.3.1 Raspberry Pi Desktop for PC and Mac

Debian with Raspberry Pi Desktop is our operating system for PC and Mac. It provides the Raspberry Pi OS desktop, as well as most of the recommended software that comes with Raspberry Pi OS, for any PC or Apple Mac computer