

Computer

What you're planning on doing with your server will dictate the hardware you'll need to fulfill those requirements.



Raspberry Pi 4



Desktop Computer

When you're running one or two services, a Raspberry Pi would probably suffice, while running your own personal cloud services might require a refurbished desktop computer.

Running a media server may require a faster processor, a decent graphics card and adequate storage space for digital media.

Core Processor

Choosing the type of main processor you will use for your server is an important decision.

Acute

speed

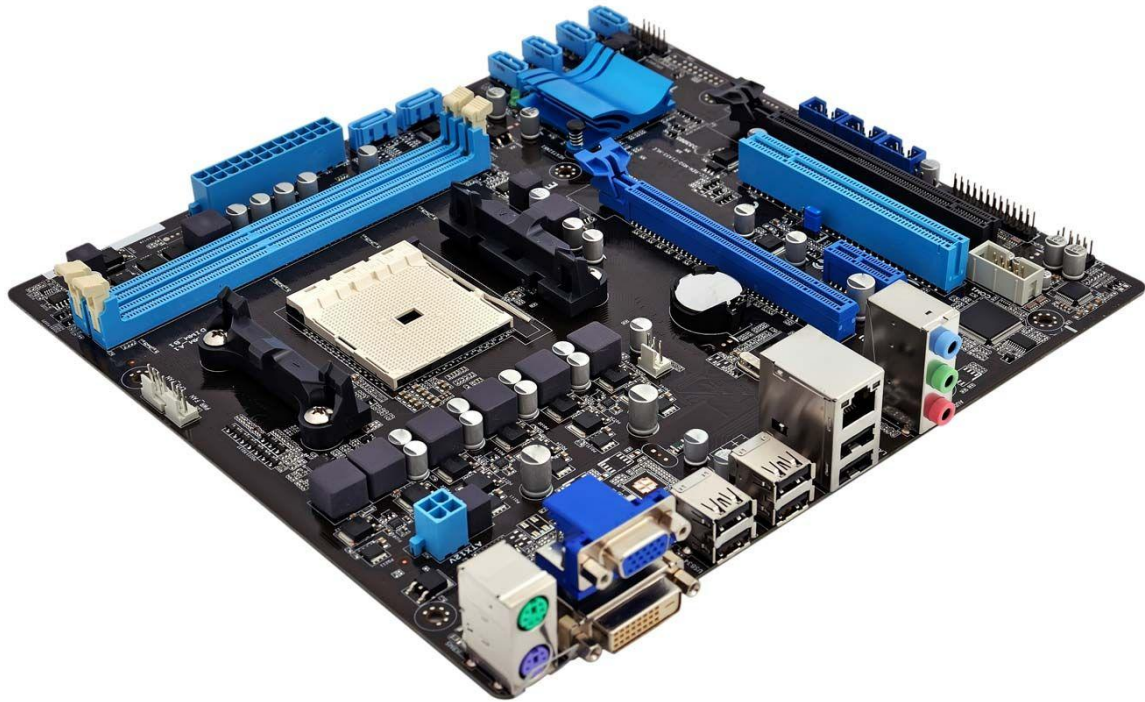
Released

2011 or newer

Speed

1.8GHz or higher

Single-Board Computers



These processors focus on sustained processing power and can handle much more intensive tasks. Most traditional computers come with active cooling mechanisms – such as fans or liquid cooling.

These types of computers are great for hosting your own personal cloud with a variety of services, such as [OwnCloud](#), [Jellyfin](#), [qBittorrent](#), or [media procurement](#) services.

Graphics Processor

When it comes operating a server, graphics cards can be leveraged by certain applications. Compared to computational processors, graphics cards have the ability to run many processes in parallel. This is a great advantage for image and video processing, as well as some general-purpose large-scale data analysis and number crunching.

Acute

Released

2016 or newer

Speed

Processor Speed

1.0GHz or higher

Memory

Memory Capacity

4GB or higher

Developer_board

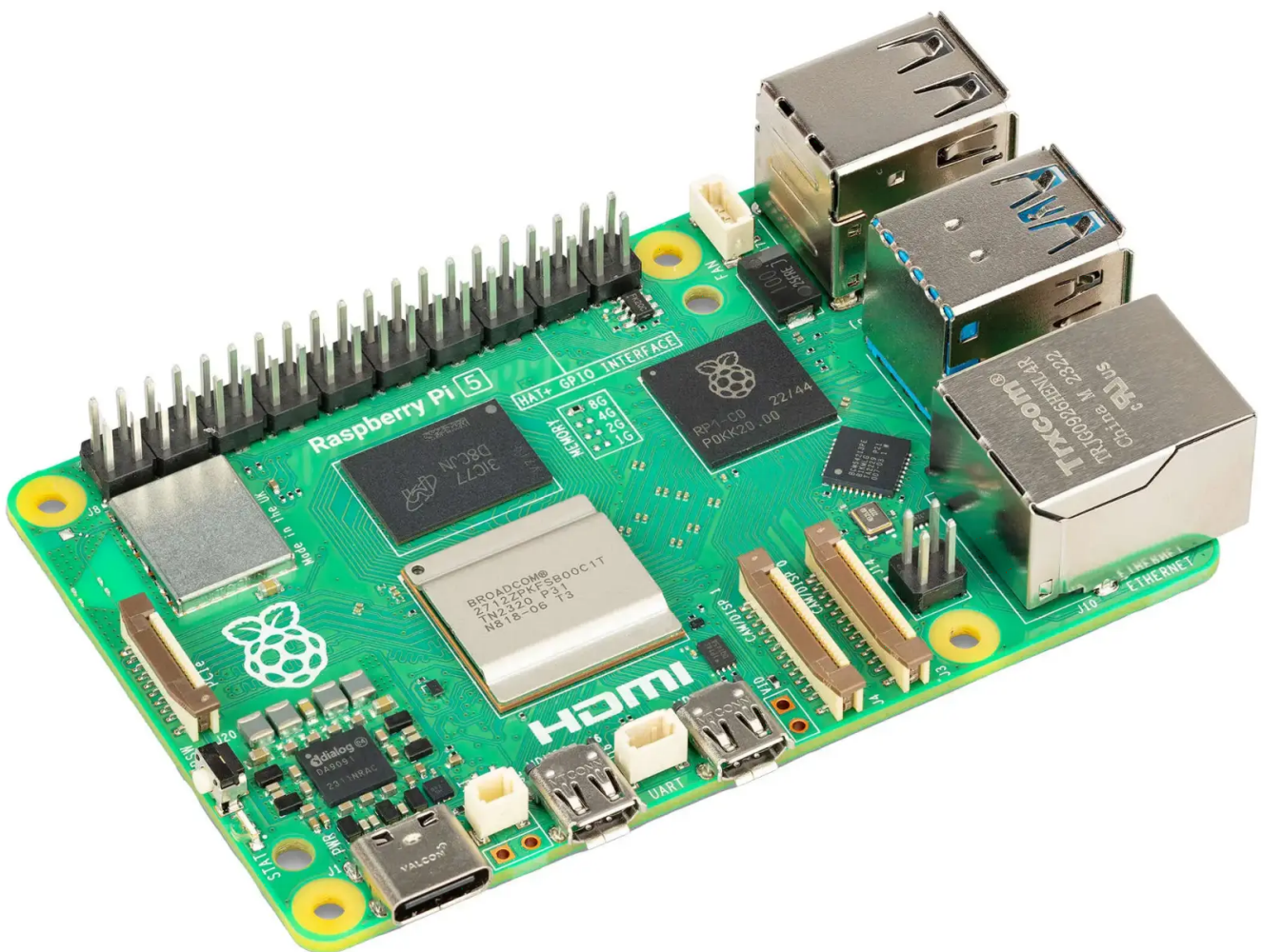
Interface

PCI-e 3.0 or newer

Single-Board Computers

While Raspberry Pi computers are useful for small computational tasks, they can often lack the graphical processing necessary to do complex image processing tasks. These computers do not have dedicated graphics processors and instead rely on a "system-on-a-chip" that shares graphical and computational power.

Generally, these types of systems cannot be modified to add more graphical processing power. Newer models can have an attached PCI-e graphics card, but this requires an add-on board and can be complicated to setup.



Personal Computers

Traditional computers have a powerful advantage here because they are so customizable. Modern processors have decently powerful graphic processors directly integrated into them. Thanks to the extensible PCI-e interface in desktop computers, we can install an additional graphics processor – or a graphics cards – with much more dedicated power.



Dedicated graphics cards have specialized cores that allow them to convert videos more efficiently than a CPU. These can be helpful for tasks that deal with images – such as Jellyfin processing a movie for streaming through a media server.

Memory

The amount and speed of random access memory – or RAM – can affect the responsiveness of your server. Your server will need more memory when it needs to juggle multiple services at once.

Memory

Capacity

8GB or higher

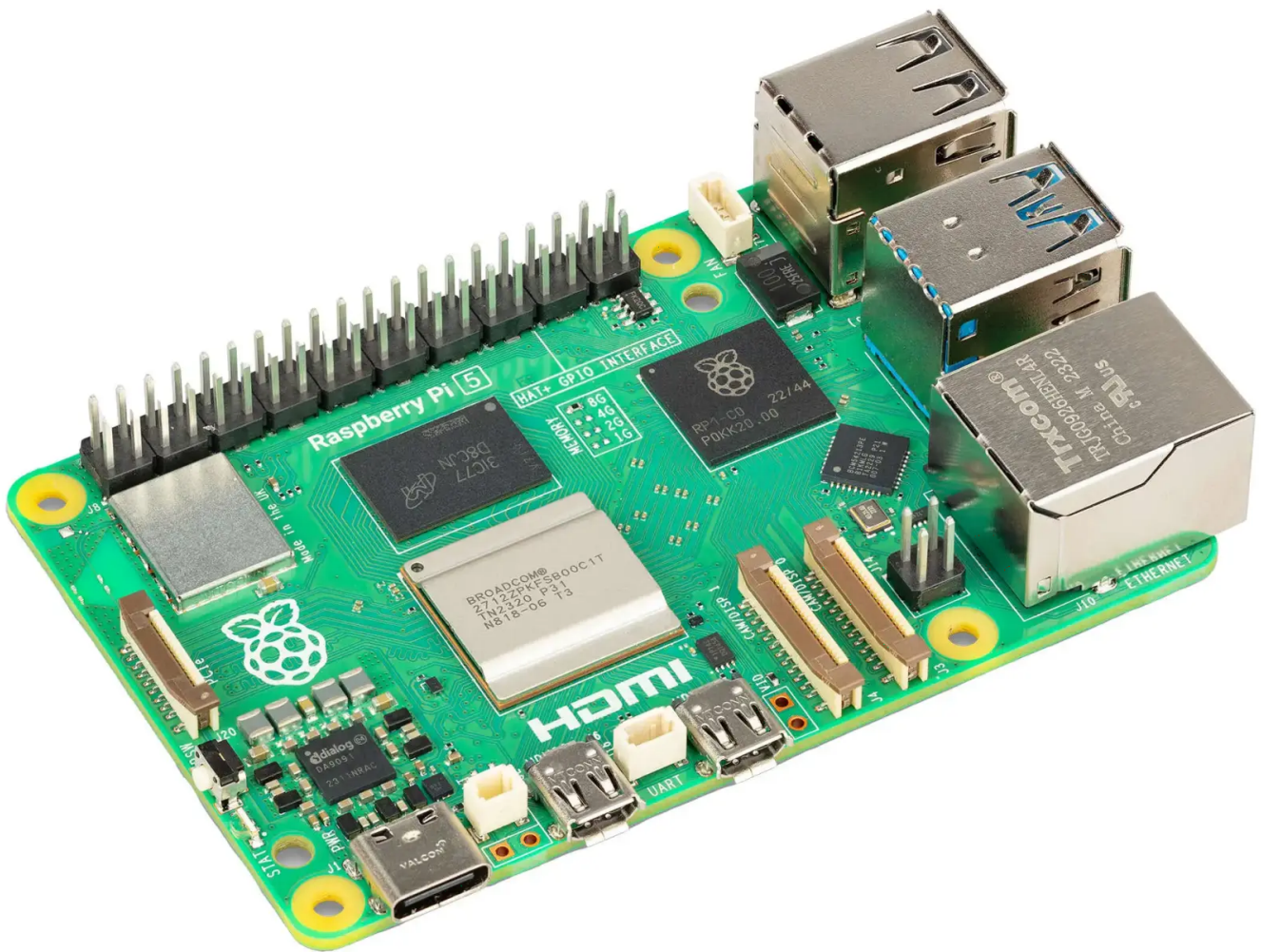
Category

Type

DDR4 or newer

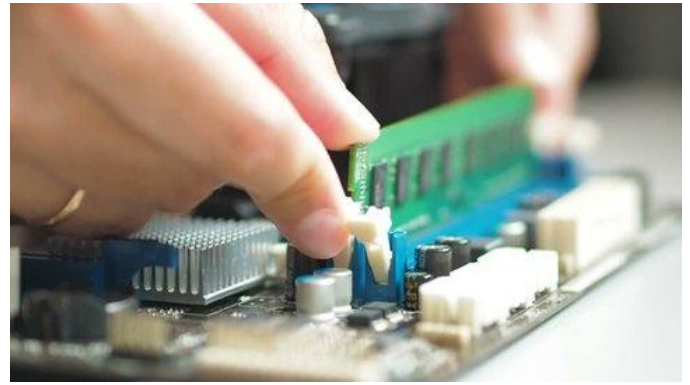
Single-Board Computers

Raspberry Pi computers use a "low-powered" variant called LPDDR. This can decrease its overall speed and responsiveness during multitasking. These computers cannot have their RAM upgraded. Raspberry Pi computers are required to share their available memory with their graphics processor.



Personal Computers

Traditional computers use the DDR class of RAM. Unlike single-board computers, memory can be upgraded by purchasing RAM modules of the same type and timing.



Storage

When figuring out storage space for a server, there are generally two types that are employed to fulfill different roles.

Platter disks are based on an older, well-tested technology originating in the 1950s. Modern hard disk drives commonly use the SATA protocol. They are slower, but can hold up to 20TB of storage per drive making them great for multimedia or document storage.



Platter Hard Disk Drive

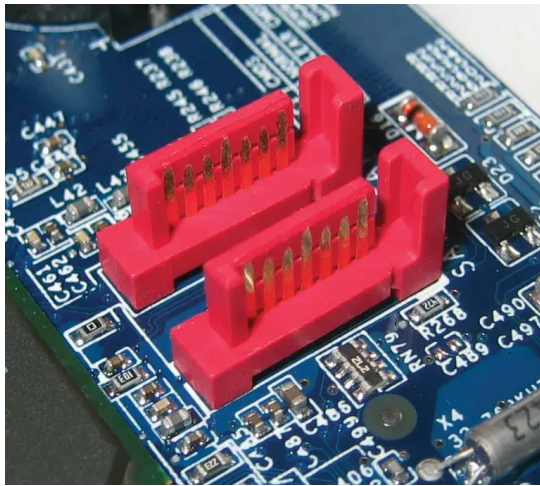


NVMe

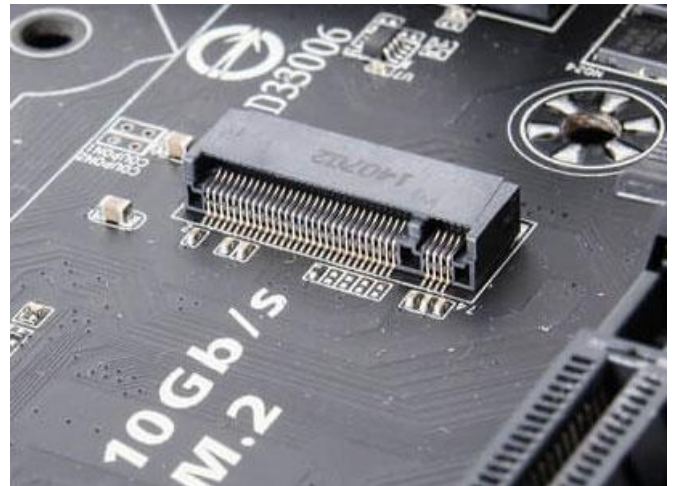
Solid State Drive

Solid state drives use the newer flash memory standard popularized by the smart phones. SSDs are incredibly fast, but storage space often comes at a premium price. These drives can use the SATA protocol like traditional hard drives, but they are increasingly available using an M.2 port.

These "Non-Volatile Memory express" - or NVMe drives - transport data over the same speedy PCIe interface as graphics cards.



SATA Port



M.2 Port

Solid state drives, especially NVMe drives, are the best option for storing the operating system and other configuration files. When hosting a media server – such as [Jellyfin](#), [Audiobookshelf](#) or [Kavita](#) – storing databases, metadata, and other cache files on an SSD can greatly improve the media server's responsiveness.

Graph/table of different speeds SD, HDD, SSD, nvme, ram

Type	Read Speed	Write Speed	Capacity
MicroSD C1	10 — 100 MB/s	10 — 100 MB/s	16GB — 1TB
MicroSD U1	10 — 100 MB/s	10 — 100 MB/s	16GB — 1TB
SATA HDD	80 — 160 MB/s	80 — 160 MB/s	250GB — 32TB
SATA SSD	200 — 600 MB/s	200 - 600 MB/s	250GB — 20TB
NVMe SSD	5000 MB/s	6000 MB/s	120GB — 4TB
RAM	40 GB/s	40 GB/s	4GB — 512GB

Each of these storage drive technologies are also available to be used as an external disk over a USB, Thunderbolt or eSata connection. This allows you to expand your storage options beyond what will fit inside of your computer case.

When hosting multiple services from a single server – such as a personal Jellyfin media server and public WordPress site – it can be advantageous to store each of their files on seperate storage drives. Alongside other security benefits, this helps to balance the load across multiple hard drives to avoid a hardware bottleneck. Similarly, storing seldom accessed files – like your multimedia – on traditional platter drives allows them to conserve power by idling unused hard disks.

Terminal

Operating System

SSD 150GB or greater, NVMe or SATA

Manufacturing

Service Files

SSD 150GB or greater, NVMe or SATA

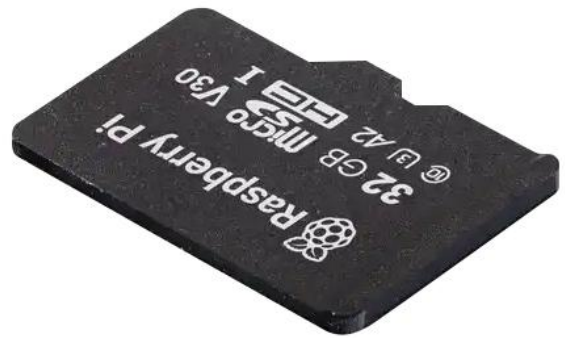
Subscriptions

Multimedia & Documents

HDD 2TB or greater, SATA

Single-Board Computers

When using a Single-Board computer – such as the Raspberry Pi – the primary operating system is typically stored on a MicroSD flashcard. These are tied to rating systems that gauge the flash memories speed and performance.



Three common categorization systems are the:

- Speed Class
- UHS Speed Class



These are signified by symbols visible on the SD card and it's packaging. For the best performance, Raspberry Pi recommends a Speed Class of C10 – or a UHS Speed Class of U1. These provide a guaranteed transfer speed of 10MB/second.

	Speed Classes			Applicable Video Format The necessary speed varies by each recording and playback device
	Speed Class	UHS Speed Class	Video Speed Class	
90MB/sec			V90	
60MB/sec			V60	
30MB/sec		U3	V30	
10MB/sec	10	U1	V10	
6MB/sec	6		V6	
4MB/sec	4			
2MB/sec	2			

In addition to the on-board SD card, Single-Board Computers are equipped with USB3.0 ports to connect additional storage space. For the best performance, you can even buy an add-on to attach an [M.2 NVMe drive](#).

Personal Computers

Traditional computers often have an array of ports for attaching storage drives. Depending on the form factor of the computer – such as a mini PC as compared to a Workstation – there can a wide range in the quantity.



Compact PCs often support one or two additional drives, while a full workstation computer can often accommodate six or more. This can be a combination of M.2 slots and SATA ports. For external storage, most computers have USB3.0 or even eSATA.

Connectivity

A network-connected server should be connected to your router with a hard-wired Cat6 Ethernet cable.



Wireless internet should be avoided for always-on services where reliability is crucial.

Your server should have a 1Gbit or preferably 2.5Gbit connection speed. This is related to the throughput available for your local area network and not your Internet service provider speed.

BlueTooth can be used to connect smart devices to Home Assistant, but is not crucial for any server functions and should be disabled when not in use. BlueTooth hacking is a common avenue for exploitation when left on.

Settings_ethernet

Wired Connection

1Gbit or higher; Cat6 RJ45 Ethernet cable

Wifi

Wireless Connection

Disabled

Bluetooth

BlueTooth

Disabled

Revision #56

Created 6 February 2025 07:49:03 by metaphorraccoon

Updated 22 May 2025 08:13:15 by metaphorraccoon