



Resources and Upgrades

SLQ Wiki Fabrication Lab 2024/03/29 15:30

Resources and Upgrades

Hardware Resources

Official Documentation

HP has an official support site for your computer that can be found at [here](#), along with all the [manuals](#). The [technical manual](#) is the most useful document for learning about your computer.

Hardware Sites

A large part of building a computer is doing the research into how components fit together. Every time you upgrade one part, it may mean that you have to replace others.

For example, changing your motherboard will may require upgrading your CPU, adding a GPU may mean upgrading your PSU.

There are many sites dedicated to finding, reviewing, discussing and selling PC hardware. A google search will usually turn up one of the following sites:

- [Toms Hardware](#)
- [Anandtech](#)
- [Guru3d](#)

The technical terms used and speed of change can be hard to keep up with, but hopefully the SDLW program has prepared you for getting started.

Upgrading or Replacing Parts in your Computer

In this sections we will give you some tips on how and where to get upgrades.

If you are based in Brisbane, there are a few stores that sell on-line with pick-up available. This is usually the cheapest way to buy locally.

For regional areas, we suggest you support you local retailer and find a store as you can usually ask for items to be ordered specially. If you can't buy local, try to find a store with cheap or free shipping.

For small, light items like RAM or even SSD drives buying internationally can be cheaper.

We don't endorse or associate with these stores in any way - this workshop is just about showing you

how the online ordering process works.

Finding and Purchasing Parts Online

With so many types and brands of computer components, finding the exact type you need can be hard. We will go through using a store based search system, then introduce using [PCPartPicker](#), which searches many stores at once.

You will usually need a credit card to make online purchases, but some stores will let you pay when you collect from the store.

Budget Upgrades

Parts you can easily upgrade or replace;

- an *extra* hard-drive
- a *replacement* hard-drive for your OS.
- more *RAM*.
- a dedicated *GPU*.

An Extra Hard Drive

The best use of an extra drive is usually as data storage. This means its a place to store files, but your operating system isn't installed on the drive.

Do I Need an Extra Drive?

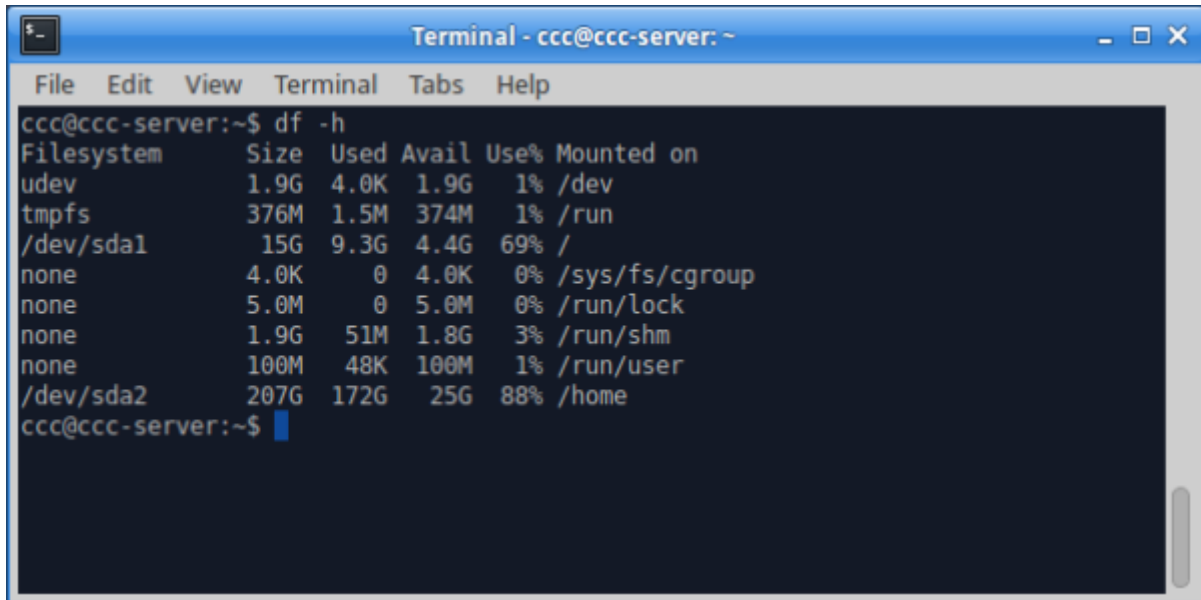
When your drive is about 90 percent full then it's time to think about a new drive.

For example,if your drive is 200gig, you can use about 180gig.

To check the amount of space, in the terminal use the disk free command (df).

```
df -h
```

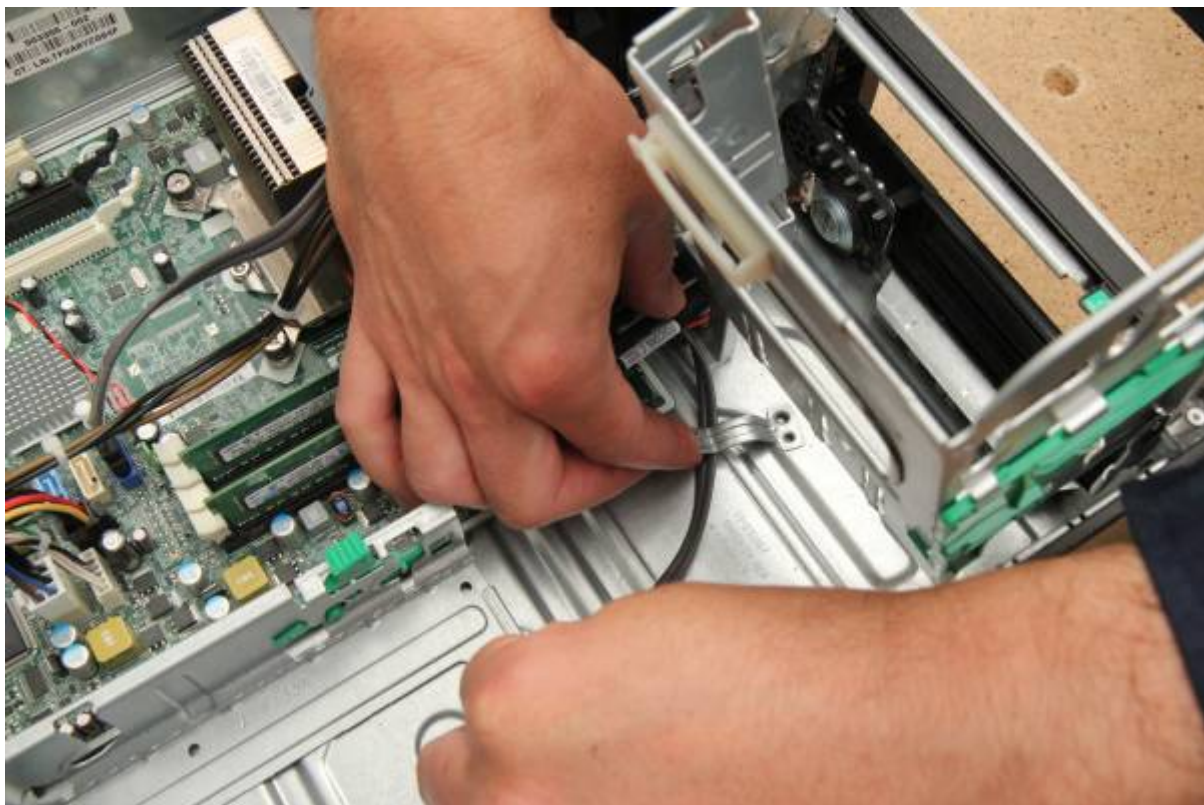
The -h flag gives you human readable numbers - that means gigabytes. You will see something like this.

A screenshot of a terminal window titled "Terminal - ccc@ccc-server: ~". The window has a menu bar with "File", "Edit", "View", "Terminal", "Tabs", and "Help". The terminal output shows the command "df -h" and its results in a table format. The table lists filesystems, their sizes, used space, available space, usage percentage, and mount points. The /dev/sda2 partition is highlighted with a blue cursor.

```
ccc@ccc-server:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            1.9G   4.0K   1.9G   1% /dev
tmpfs           376M   1.5M   374M   1% /run
/dev/sda1       15G   9.3G   4.4G  69% /
none            4.0K    0   4.0K   0% /sys/fs/cgroup
none            5.0M    0   5.0M   0% /run/lock
none            1.9G   51M   1.8G   3% /run/shm
none            100M   48K   100M   1% /run/user
/dev/sda2      207G  172G   25G  88% /home
ccc@ccc-server:~$
```

Where does it fit?

Your computer has a second bay under your existing hard-drive.



Which Part?

To buy the right part, you will need to know;

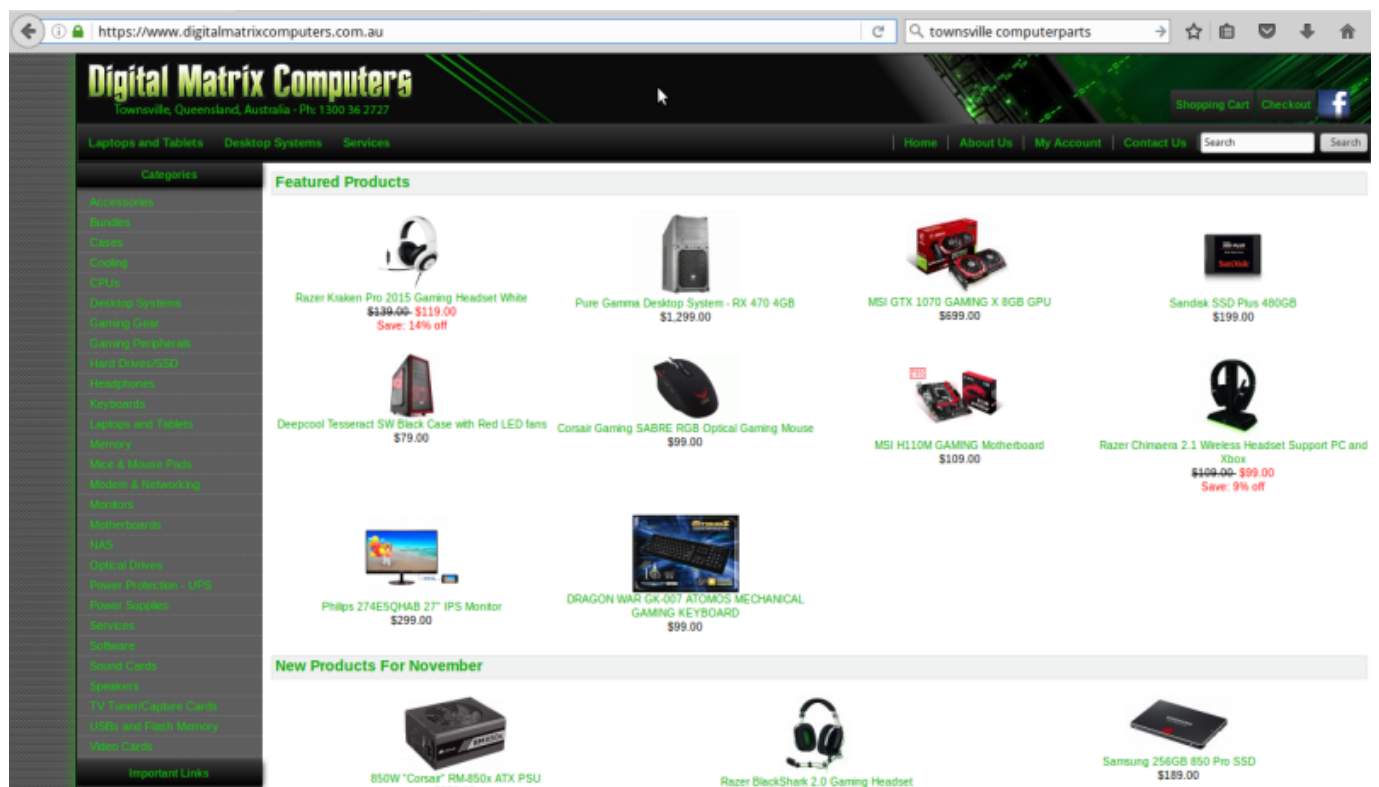
- the form factor (3 1/2 inch)

- the connector type (SATA)
- the capacity you want (in Gigabytes)

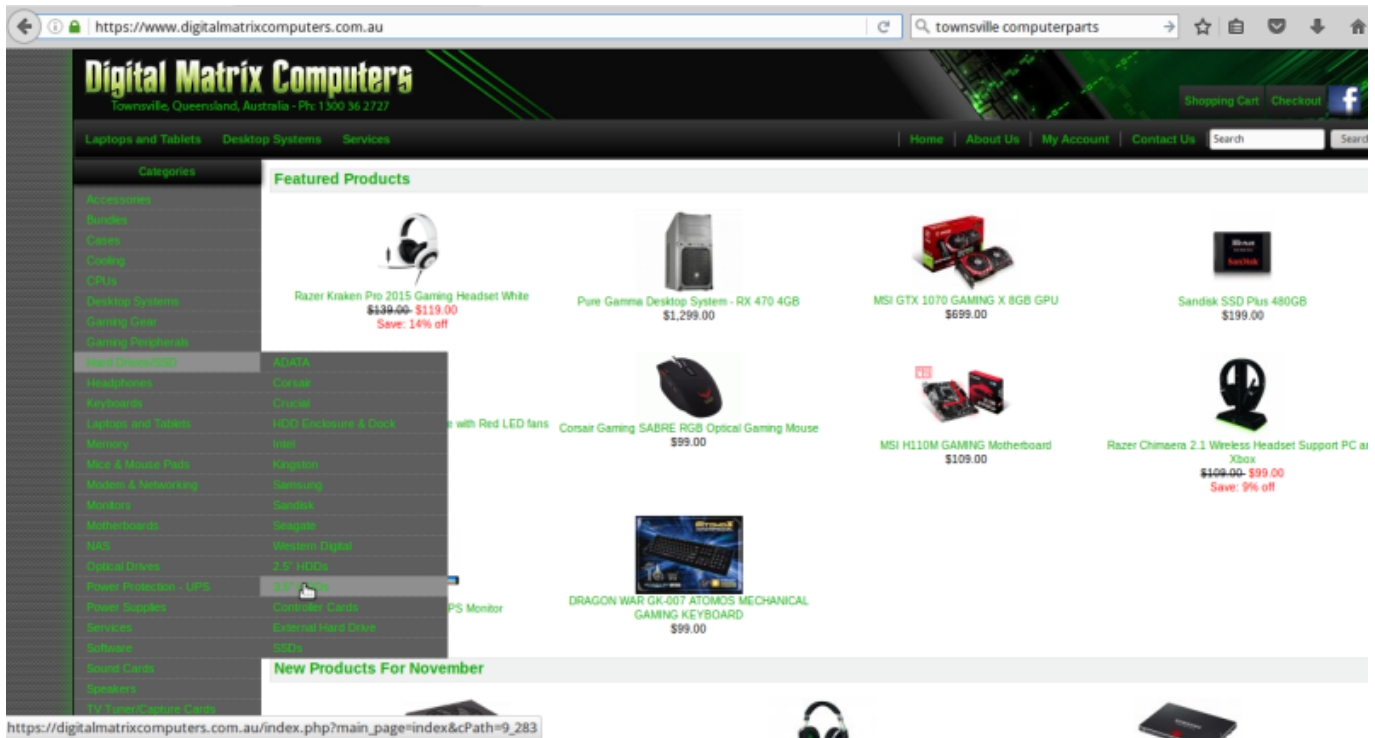
Ordering Online

Lets have a look at ordering from a Townsville store [Digital Matrix Computers](https://www.digitalmatrixcomputers.com.au) for an example of using a local store.

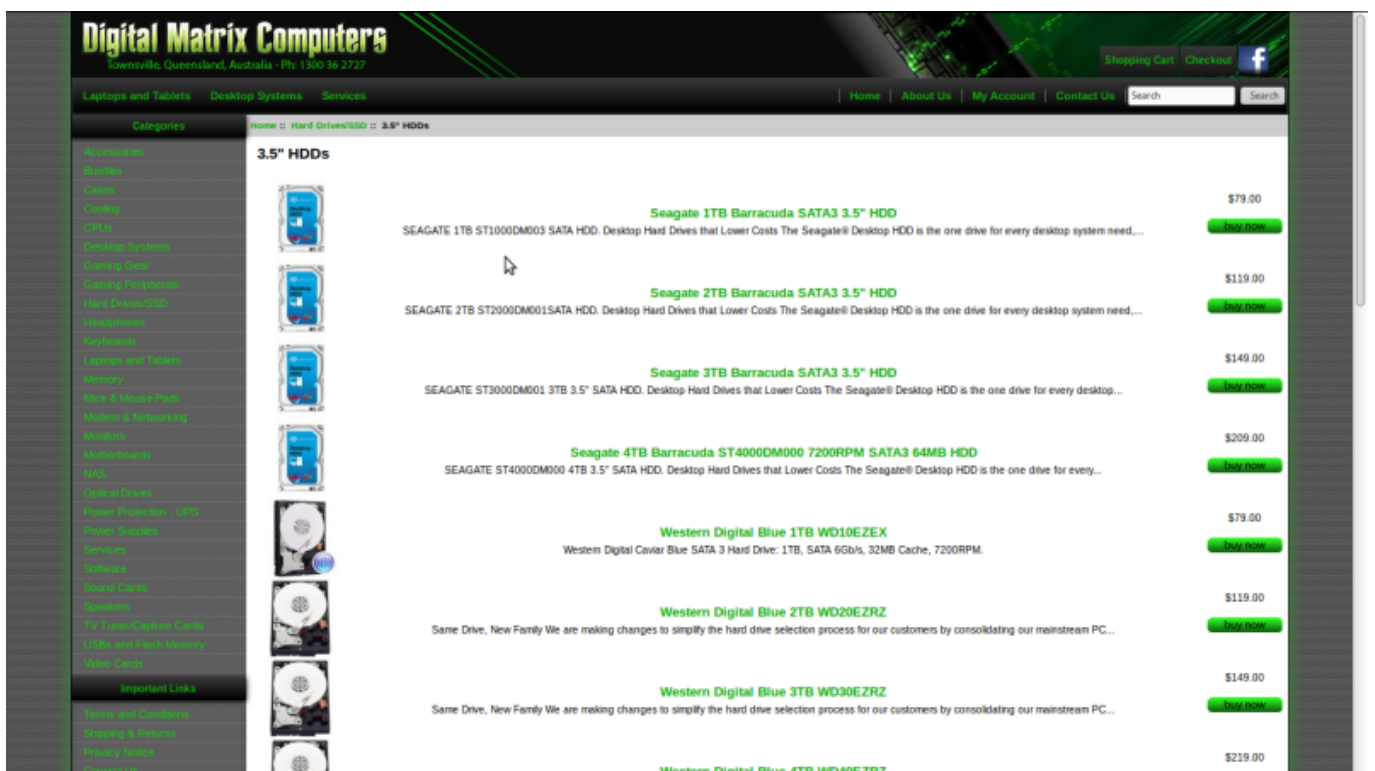
Like most stores, the front page has specials and a list of products.



Lets go through that list on the left and find the 3 1/2 inch hard drives.




The first hard drive looks good -click on it for some more details



To make sure this is the part we want, check the name for ;

- the form factor (3.5" means 3 1/2 inch)
- the connector type (SATA)
- the capacity you want - 1 terabyte= 1000 gigabytes.

Home :: Hard Drives/SSD :: 3.5" HDDs :: Seagate 1TB Barracuda SATA3 3.5" HDD



Seagate 1TB Barracuda SATA3 3.5" HDD - \$79.00

Like Share 0

Quantity in Cart: 1

Add to Cart:

[add to my cart](#)

[add to my wishlist](#)

[larger image](#)

SEAGATE 1TB ST1000DM003 SATA HDD.




Next - add it to your shopping cart



Once the item is in your cart, you can go to the check-out.

Home :: The Shopping Cart

Your Shopping Cart Contents [\[help ?\]](#)

Total Items: 1 Weight: 1kilos Amount: \$79.00

Qty.	Item Name	Unit	Total
<input type="text" value="1"/>  	Seagate 1TB Barracuda SATA3 3.5" HDD	\$79.00	\$79.00 
			Sub-Total: \$79.00

[back to shopping](#)  [go to checkout](#) 

Estimate Shipping Costs

Country:

Post/Zip Code:

[update](#)

Shipping quotes are based on the address information you selected:
AITKENVALE 4814 TO 4807 AUSTRALIA

Available Shipping Methods	Rates
Store Pickup Walk In	\$0.00

You will need an account to buy your part. Some stores let you buy without an account, but its a good idea to make an account to track your order. Done!

Welcome, Please Sign In

Note: If you have shopped with us before and left something in your cart, for your convenience, the contents will be merged if you log back in. [\[More info\]](#)

Returning Customers: Please Log In

Email Address:

Password:

[Forgot your password?](#) [login](#)

New? Please Provide Your Billing Information

Create a customer profile with **Digital Matrix Computers** which allows you to shop faster, track the status of your current orders and review your previous orders. * Required information

Company Details

Company Name:

Address Details

☐ Mr. ☐ Ms. *

First Name: *

Last Name: *

Street Address: *

Address Line 2:

City: *

State/Province: *

Post/Zip Code: *

Country: *

Additional Contact Details

Telephone: *

Fax Number:

Login Details

Email Address: *

Password: * (at least 7 characters)

Confirm Password: *

Do you need another SATA cable for your drive? If so remember to order one.

Using your New Drive

Once you have installed your new drive you will need to format it to a linux native format - like EXT4. Check out the [format](#) section of workshop 03.

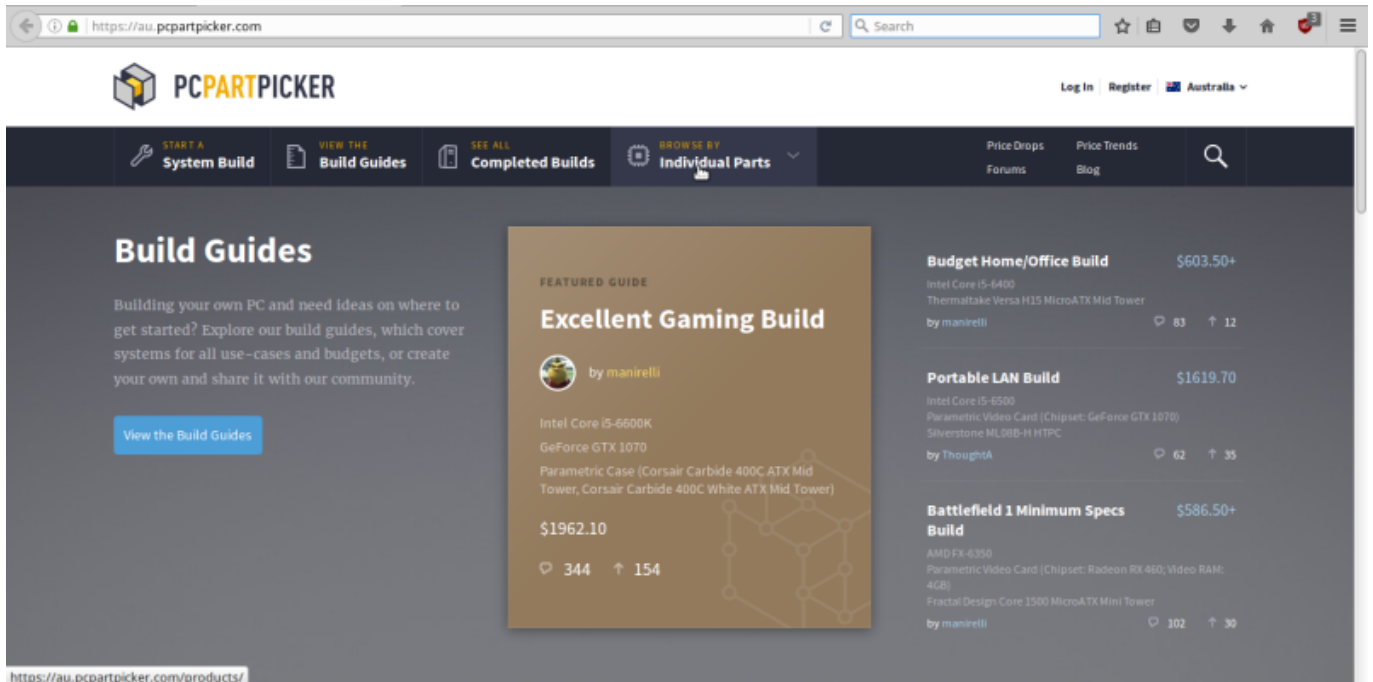
a Replacement Hard Drive

The most 'bang for buck' of upgrades is installing an [SSD](#). Your computer will boot much faster, and programs will load very quickly.

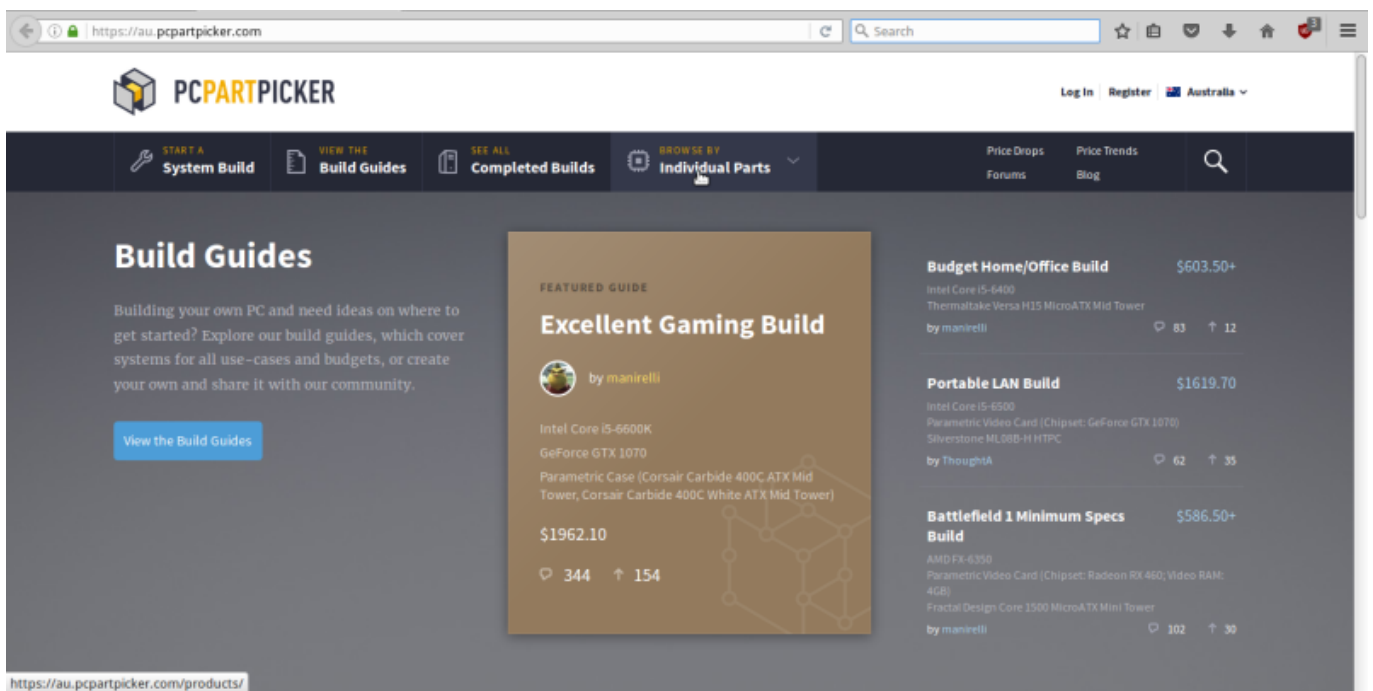
The important thing to know about installing an SSD is that SSDs are almost always 2 1/2 inch format (remember what size your [hard-drive](#) bays are?) so you will need a 2 1/2 inch to 3 1/2 SSD adaptor.

Lets try using pcpartpicker to find the right part. To make sure we get a store we know, we will use the options to search only umart. We will then search in Umart store itself for an SSD adaptor.

First up, go to [pcpartpicker](#), make sure you are in the Australian store (with the Australian flag) and select 'Individual Parts'



Next select 'storage' from the parts menu



pcpartpicker will now show you all the parts it can find that fit in the storage list. You should see some labels you recognise. Don't worry if there is too much detail, we will be making our choice easier.

Choose Storage

Filters

MERCHANTS / PRICING

☒ Include mail-in rebates

INCLUDE MERCHANTS

☐ All

☐ Centre Com

☐ IJK

☐ Mwave Australia

☐ Newegg Australia

☐ PCCaseGear

☐ PLE Computers

☐ RamCity

☐ ScorpTec

☐ Skycomp Technology

☐ Shopping Express

☐ Storm Computers

Parts

Search Storage:

Compare Selected Clear Selection

Set Price Alert Add From Filter

	Storage	Series	Form	Type	Capacity	Cache	Price/GB	Rating	Combo	Price	
<input type="checkbox"/>	Western Digital WD10EZEX	Caviar Blue	3.5"	7200RPM	1TB	64MB		★★★★★ (1453)			Add
<input type="checkbox"/>	Samsung MZ-75E250B/AM	850 EVO-Series	2.5"	SSD	250GB	N/A	\$0.500	★★★★★ (345)		\$125.00	Add
<input type="checkbox"/>	Samsung MZ-75E500B/AM	850 EVO-Series	2.5"	SSD	500GB	N/A	\$0.438	★★★★★ (204)		\$219.00	Add
<input type="checkbox"/>	Seagate ST2000DM001	Barracuda	3.5"	7200RPM	2TB	64MB		★★★★★ (425)			Add
<input type="checkbox"/>	PNY SSD7CS1311-120-RB	CS1311	2.5"	SSD	120GB	N/A		★★★★★ (8)			Add
<input type="checkbox"/>	Samsung MZ-75E1T0B/AM	850 EVO-Series	2.5"	SSD	1TB	N/A	\$0.449	★★★★★ (22)		\$449.00	Add
<input type="checkbox"/>	ADATA ASP550S53-240GM-C	Premier SP550	2.5"	SSD	240GB	N/A		★★★★★ (29)			Add
<input type="checkbox"/>	Intel SSDPECM040T401	DC P3608	PCI-E	SSD	4TB	N/A		★★★★★ (0)			Add

First go over to 'show merchants' -this will show us the shops we can search.

Choose Storage

Filters

MERCHANTS / PRICING

☒ Include mail-in rebates

Show merchants...

PRICE

\$0 \$2540

RATING

☒ All

☐ ★★★★★

☐ ★★★★★

☐ ★★★★★

☐ ★★★★★

☐ ★★★★★

☐ ★★★★★

MANUFACTURER

☒ All

☐ Hitachi

☐ PNY

☐ Samsung

☐ Seagate

Parts

Search Storage:

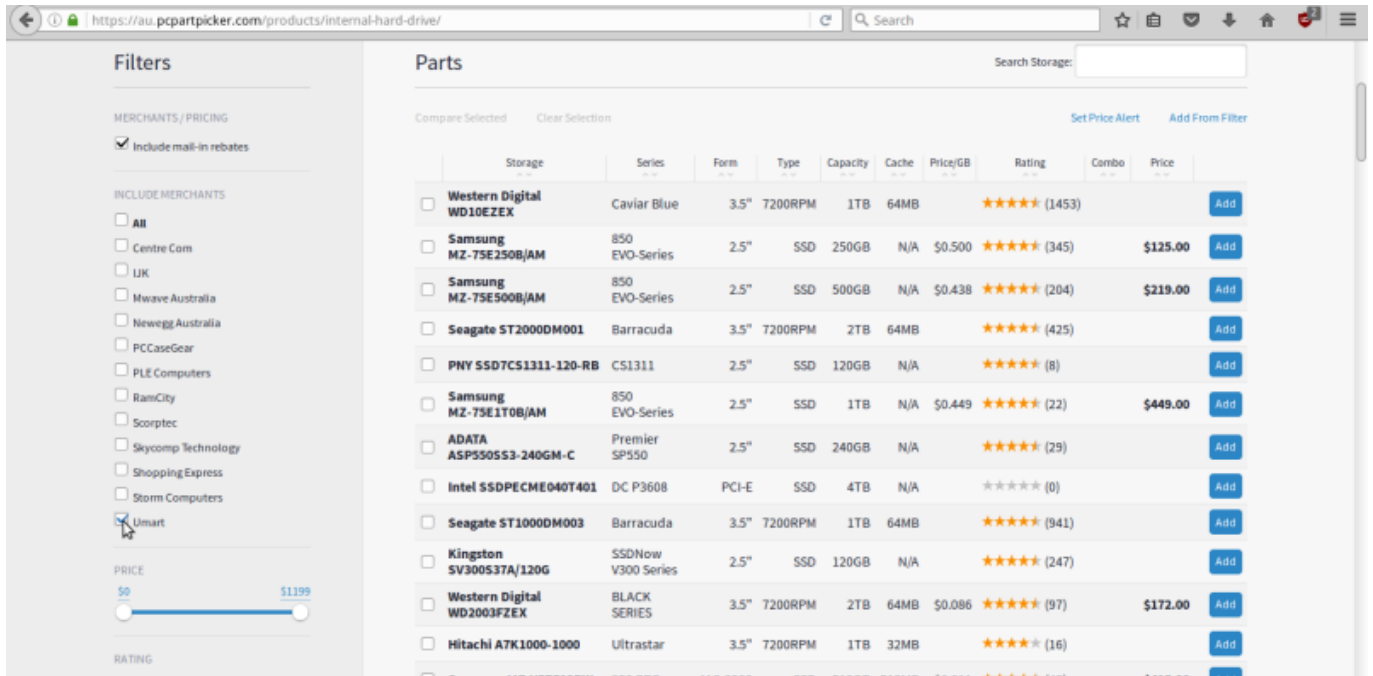
Compare Selected Clear Selection

Set Price Alert Add From Filter

	Storage	Series	Form	Type	Capacity	Cache	Price/GB	Rating	Combo	Price	
<input type="checkbox"/>	Western Digital WD10EZEX	Caviar Blue	3.5"	7200RPM	1TB	64MB	\$0.064	★★★★★ (1453)		\$64.00	Add
<input type="checkbox"/>	Samsung MZ-75E250B/AM	850 EVO-Series	2.5"	SSD	250GB	N/A	\$0.496	★★★★★ (345)		\$124.00	Add
<input type="checkbox"/>	Samsung MZ-75E500B/AM	850 EVO-Series	2.5"	SSD	500GB	N/A	\$0.418	★★★★★ (204)		\$209.00	Add
<input type="checkbox"/>	Seagate ST2000DM001	Barracuda	3.5"	7200RPM	2TB	64MB	\$0.048	★★★★★ (425)		\$97.00	Add
<input type="checkbox"/>	PNY SSD7CS1311-120-RB	CS1311	2.5"	SSD	120GB	N/A		★★★★★ (8)			Add
<input type="checkbox"/>	Samsung MZ-75E1T0B/AM	850 EVO-Series	2.5"	SSD	1TB	N/A	\$0.439	★★★★★ (22)		\$439.00	Add
<input type="checkbox"/>	ADATA ASP550S53-240GM-C	Premier SP550	2.5"	SSD	240GB	N/A	\$0.400	★★★★★ (29)		\$95.99	Add
<input type="checkbox"/>	Intel SSDPECM040T401	DC P3608	PCI-E	SSD	4TB	N/A		★★★★★ (0)			Add
<input type="checkbox"/>	Seagate ST1000DM003	Barracuda	3.5"	7200RPM	1TB	64MB	\$0.065	★★★★★ (941)		\$65.00	Add
<input type="checkbox"/>	Kingston SV300S37A/120G	SSDNow V300 Series	2.5"	SSD	120GB	N/A	\$0.571	★★★★★ (247)		\$68.46	Add
<input type="checkbox"/>	Western Digital WD2003FZEX	BLACK SERIES	3.5"	7200RPM	2TB	64MB	\$0.085	★★★★★ (97)		\$170.00	Add
<input type="checkbox"/>	Hitachi A7K1000-1000	Ultrastar	3.5"	7200RPM	1TB	32MB		★★★★★ (16)			Add

<https://au.pcpartpicker.com/products/internal-hard-drive/#>

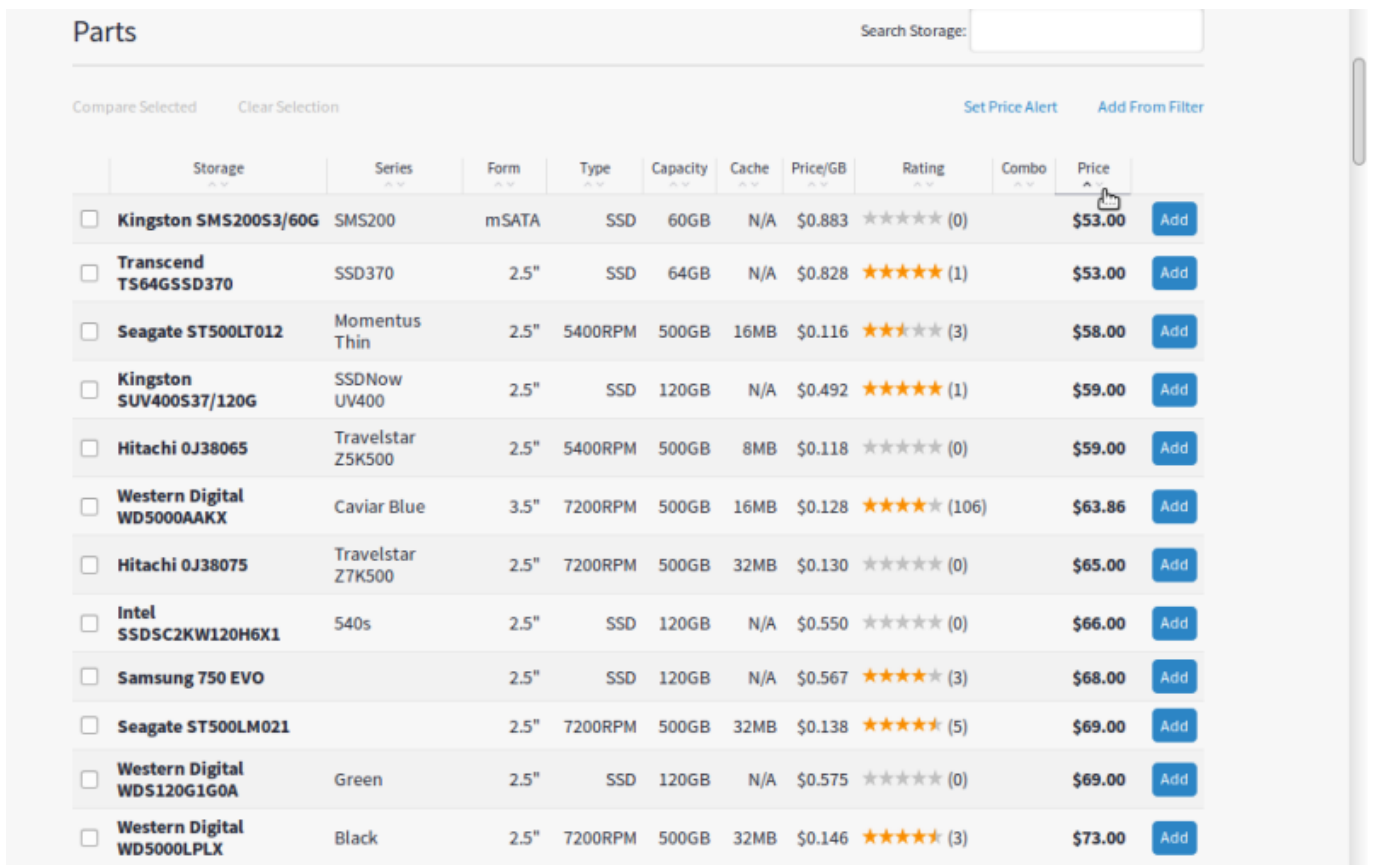
Uncheck the 'all' box and check the 'umart' box. This will show us only what we can buy on umart.



The screenshot shows the PCPartPicker website with a list of internal hard drives. The 'Price' column is highlighted, indicating the list is sorted by price. The list includes various models from Western Digital, Samsung, Seagate, PNY, Kingston, and Hitachi.

Storage	Series	Form	Type	Capacity	Cache	Price/GB	Rating	Combo	Price
<input type="checkbox"/> Western Digital WD10EZEX	Caviar Blue	3.5"	7200RPM	1TB	64MB		★★★★★ (1453)		
<input type="checkbox"/> Samsung MZ-75E250B/JAM	850 EVO-Series	2.5"	SSD	250GB	N/A	\$0.500	★★★★★ (345)		\$125.00
<input type="checkbox"/> Samsung MZ-75E500B/JAM	850 EVO-Series	2.5"	SSD	500GB	N/A	\$0.438	★★★★★ (204)		\$219.00
<input type="checkbox"/> Seagate ST2000DM001	Barracuda	3.5"	7200RPM	2TB	64MB		★★★★★ (425)		
<input type="checkbox"/> PNY SSD7C51311-120-RB	CS1311	2.5"	SSD	120GB	N/A		★★★★★ (8)		
<input type="checkbox"/> Samsung MZ-75E1T0B/JAM	850 EVO-Series	2.5"	SSD	1TB	N/A	\$0.449	★★★★★ (22)		\$449.00
<input type="checkbox"/> ADATA ASP550553-240GM-C	Premier SP550	2.5"	SSD	240GB	N/A		★★★★★ (29)		
<input type="checkbox"/> Intel SSDPECMEO40T401	DC P3608	PCI-E	SSD	4TB	N/A		★★★★★ (0)		
<input type="checkbox"/> Seagate ST1000DM003	Barracuda	3.5"	7200RPM	1TB	64MB		★★★★★ (941)		
<input type="checkbox"/> Kingston SV300S37A/120G	SSDNow V300 Series	2.5"	SSD	120GB	N/A		★★★★★ (247)		
<input type="checkbox"/> Western Digital WD2003FZEX	BLACK SERIES	3.5"	7200RPM	2TB	64MB	\$0.086	★★★★★ (97)		\$172.00
<input type="checkbox"/> Hitachi A7K1000-1000	Ultrastar	3.5"	7200RPM	1TB	32MB		★★★★★ (16)		

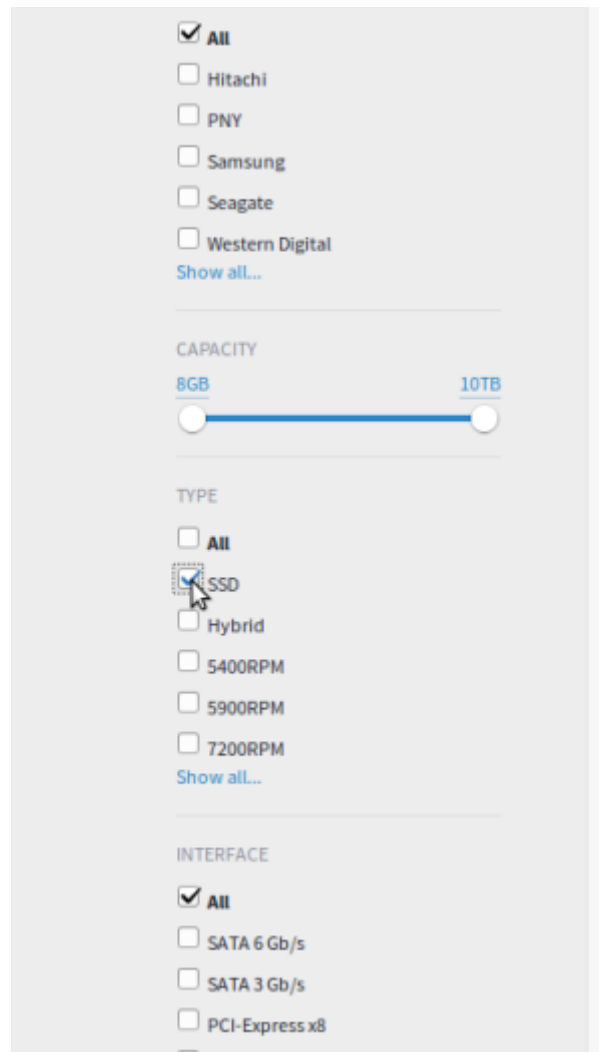
Lets re-sort our list parts, by clicking on the 'price' column.



The screenshot shows the PCPartPicker website with a list of internal hard drives. The 'Price' column is highlighted, indicating the list is sorted by price. The list includes various models from Kingston, Transcend, Seagate, Hitachi, Western Digital, and Intel.

Storage	Series	Form	Type	Capacity	Cache	Price/GB	Rating	Combo	Price
<input type="checkbox"/> Kingston SMS200S3/60G	SMS200	mSATA	SSD	60GB	N/A	\$0.883	★★★★★ (0)		\$53.00
<input type="checkbox"/> Transcend TS64GSSD370	SSD370	2.5"	SSD	64GB	N/A	\$0.828	★★★★★ (1)		\$53.00
<input type="checkbox"/> Seagate ST500LT012	Momentus Thin	2.5"	5400RPM	500GB	16MB	\$0.116	★★★★★ (3)		\$58.00
<input type="checkbox"/> Kingston SUV400S37/120G	SSDNow UV400	2.5"	SSD	120GB	N/A	\$0.492	★★★★★ (1)		\$59.00
<input type="checkbox"/> Hitachi OJ38065	Travelstar Z5K500	2.5"	5400RPM	500GB	8MB	\$0.118	★★★★★ (0)		\$59.00
<input type="checkbox"/> Western Digital WD5000AAKX	Caviar Blue	3.5"	7200RPM	500GB	16MB	\$0.128	★★★★★ (106)		\$63.86
<input type="checkbox"/> Hitachi OJ38075	Travelstar Z7K500	2.5"	7200RPM	500GB	32MB	\$0.130	★★★★★ (0)		\$65.00
<input type="checkbox"/> Intel SSDSC2KW120H6X1	540s	2.5"	SSD	120GB	N/A	\$0.550	★★★★★ (0)		\$66.00
<input type="checkbox"/> Samsung 750 EVO		2.5"	SSD	120GB	N/A	\$0.567	★★★★★ (3)		\$68.00
<input type="checkbox"/> Seagate ST500LM021		2.5"	7200RPM	500GB	32MB	\$0.138	★★★★★ (5)		\$69.00
<input type="checkbox"/> Western Digital WDS120G1G0A	Green	2.5"	SSD	120GB	N/A	\$0.575	★★★★★ (0)		\$69.00
<input type="checkbox"/> Western Digital WD5000LPLX	Black	2.5"	7200RPM	500GB	32MB	\$0.146	★★★★★ (3)		\$73.00

The off to the left - check the SSD box.



The screenshot shows a storage selection interface with the following sections:

- Brand:** A list of checkboxes for **All** (checked), Hitachi, PNY, Samsung, Seagate, and Western Digital. A [Show all...](#) link is below.
- CAPACITY:** A slider bar with [8GB](#) on the left and [10TB](#) on the right.
- TYPE:** A list of checkboxes for **All** (unchecked), **SSD** (checked, with a mouse cursor hovering over it), Hybrid, 5400RPM, 5900RPM, and 7200RPM. A [Show all...](#) link is below.
- INTERFACE:** A list of checkboxes for **All** (checked), SATA 6 Gb/s, SATA 3 Gb/s, and PCI-Express x8.

Now lets select an SSD about the size of our current drive...

Compare Selected Clear Selection Set Price Alert Add From Filter

	Storage	Series	Form	Type	Capacity	Cache	Price/GB	Rating	Combo	Price	
<input type="checkbox"/>	Kingston SMS200S3/60G	SMS200	mSATA	SSD	60GB	N/A	\$0.883	★★★★★ (0)		\$53.00	Add
<input type="checkbox"/>	Transcend TS64GSSD370	SSD370	2.5"	SSD	64GB	N/A	\$0.828	★★★★★ (1)		\$53.00	Add
<input type="checkbox"/>	Kingston SUV400S37/120G	SSDNow UV400	2.5"	SSD	120GB	N/A	\$0.492	★★★★★ (1)		\$59.00	Add
<input type="checkbox"/>	Intel SSDSC2KW120H6X1	540s	2.5"	SSD	120GB	N/A	\$0.550	★★★★★ (0)		\$66.00	Add
<input type="checkbox"/>	Samsung 750 EVO		2.5"	SSD	120GB	N/A	\$0.567	★★★★★ (3)		\$68.00	Add
<input type="checkbox"/>	Western Digital WDS120G1G0A	Green	2.5"	SSD	120GB	N/A	\$0.575	★★★★★ (0)		\$69.00	Add
<input type="checkbox"/>	Corsair CSSD-F120GBLSB	Force LS	2.5"	SSD	120GB	N/A	\$0.625	★★★★★ (2)		\$75.00	Add
<input type="checkbox"/>	Kingston SHFS37A/120G	HyperX Fury	2.5"	SSD	120GB	N/A	\$0.633	★★★★★ (28)		\$76.00	Add
<input type="checkbox"/>	Intel SSDPEKKW128G7X1	600p Series	M.2-2280	SSD	128GB	N/A	\$0.617	★★★★★ (0)		\$79.00	Add
<input type="checkbox"/>	Transcend TS128GMTS800	MTS800	M.2-2280	SSD	128GB	N/A	\$0.664	★★★★★ (3)		\$85.00	Add
<input type="checkbox"/>	Samsung MZ-M5E120BW	850 EVO	mSATA	SSD	120GB	N/A	\$0.742	★★★★★ (0)		\$89.00	Add
<input type="checkbox"/>	Kingston SUV400S37/240G	SSDNow UV400	2.5"	SSD	240GB	N/A	\$0.396	★★★★★ (6)		\$95.00	Add
<input type="checkbox"/>	Kingston SM2280S3/120G	SSDNow	M.2-2280	SSD	120GB	N/A	\$0.825	★★★★★ (0)		\$99.00	Add
<input type="checkbox"/>	Samsung 750 EVO		2.5"	SSD	250GB	N/A	\$0.420	★★★★★ (15)		\$105.00	Add
<input type="checkbox"/>	Kingston SHS537A/120G	Savage	2.5"	SSD	120GB	N/A	\$0.908	★★★★★ (5)		\$109.00	Add

inow-uv400-240gb-25-solid-state-drive-suv400s37240g

And we will be shown all the stores we can buy it from. Lets select Umart again.

Quantity: [Add to Part List](#)

[Save to Favorites](#) [Add to Inventory](#)

Specifications

MANUFACTURER
Kingston

PART #
SUV400S37/240G

CAPACITY
240GB

INTERFACE
SATA 6 Gb/s

CACHE
N/A

FORM FACTOR
2.5"

GB/\$1.00

<https://au.pcpartpicker.com/mr/umart/MVWrxr>

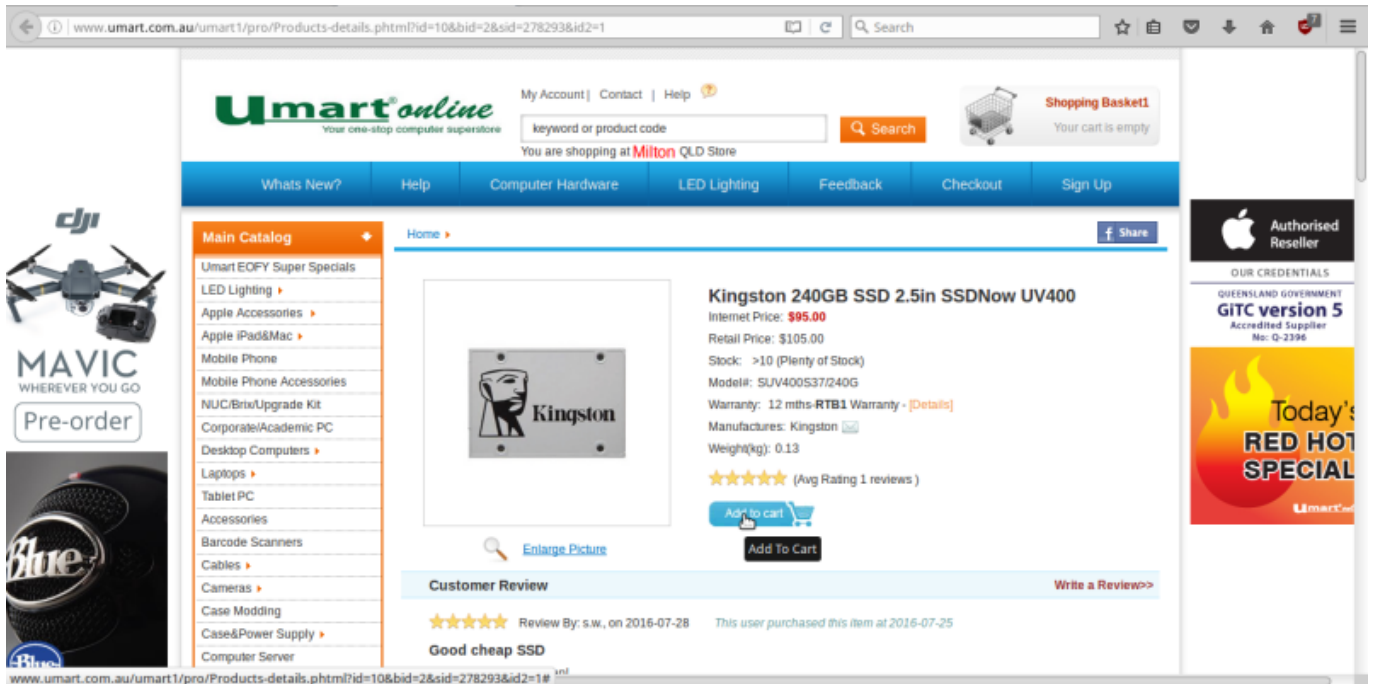
Prices

Merchant	Base	Promo	Shipping	Tax	Availability	Total
CENTRE.COM	\$94.00					\$94.00 +
IJK	\$95.00					\$95.00 +
Unig Online	\$95.00				In stock	\$95.00 +
SAV.COM.AU	\$97.90				In stock	\$97.90 +
mwave	\$98.00					\$98.00 +
PCCG	\$99.00				In stock	\$99.00 +
PLE Computers	\$99.00					\$99.00 +
scorptec	\$103.00					\$103.00 +

Send an e-mail alert if the price drops to: \$ [Set](#)

(Note: Price alerts now use your merchant selections and tax settings.)

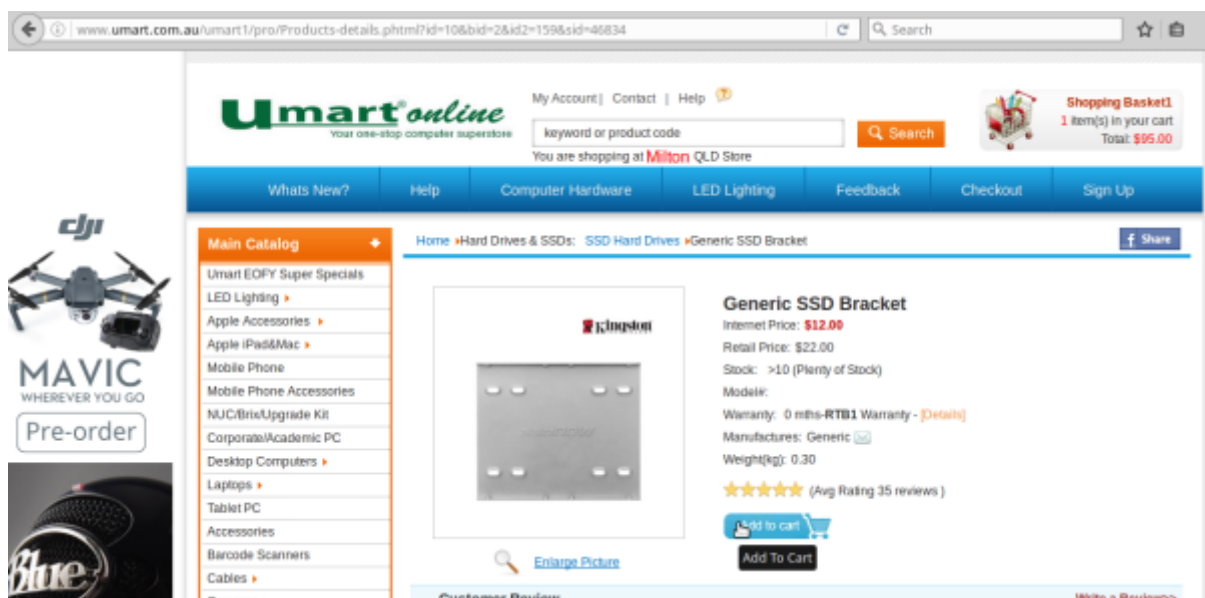
And this time we will be taken from pcpartpicker to the Umart store. Where we can add the drive to our shopping cart.



Remember we need an SSD bracket? Lets search umart for one.






We've got a 'generic' bracket, lets add it to our cart then look at our cart



Its time to check shipping costs - this is something usually done at the shopping cart..

[Home](#) > [Checkout](#) > You are shopping at **Milton** QLD Store



[Share](#)
[Tweet](#)
[Email](#)

1 You are at Pickup/Post location

2 You are at Post location

3 You are at Pickup location

Product_picture	Product	Quantity	Price	Gst	Total
	Generic SSD Bracket	<input type="text" value="1"/>	\$12.00	\$1.09	\$12.00
	Kingston 240GB SSD 2.5in SSDNow UV400	<input type="text" value="1"/>	\$95.00	\$8.64	\$95.00
Total				\$9.73	\$107.00

[Update](#) Please change the quantity if needed and click update(0 to remove an item)

[Calculate shipping](#)

[Clear cart](#)



[Sign Up](#)

[calculate](#)

I am not a member,please let me join now.
 You must be a member before buying anything from us!

[Sign Up](#)

Umart opens another window for us - lett get an estimate for shipping to Townsville - \$18 seems about right.

 **Umart[®]online**
Australia's best deals online. 

Post code:

Estimated Shipping Cost for post code 4810:

StarTrack:
Postage: Postage

Australia Post:
Postage: Postage

Fastway:
Postage: Postage



StarTrack Road Express offers nationwide delivery for all item sizes. We accept only BPAY, Direct Deposit or Credit Card, NO COD and will not ship to PO BOX.

Australia Post offers nationwide delivery for small item only (No case or monitor). We accept only BPAY or Direct Deposit, Credit Card, NO COD.

Fastway Courier offers local area delivery (including Gold Coast & Sunshine Coast) for all item sizes. We accept BPAY, Direct Deposit, Credit Card. Fastway deliver up to four times a day! Receiver must be present at the delivery address in order to accept the goods. will not ship to PO BOX.

Now its time to sign up - (or login if you've done so already)



Clear cart					
Product_picture	Product	Quantity	Price	Gst	Total
	Generic SSD Bracket	<input type="text" value="1"/>	\$12.00	\$1.09	\$12.00
	Kingston 240GB SSD 2.5in SSDNow UV400	<input type="text" value="1"/>	\$95.00	\$8.64	\$95.00
Total				\$9.73	\$107.00
<div> <div>Update</div> <div>Please change the quantity if needed and click update(0 to remove an item)</div> <div>Calculate shipping</div> </div>					

Sign Up

I am not a member,please let me join now.

You must be a member before buying anything from us!

Sign Up

And enter your details..

Thanks for joining our on-line computer store * Required Field

* Login Name:

* Password:

* Retype Password:

* First Name or Company Name:

* Last Name:

* Email:

* Address:

* Postcode:

* Suburb:

* State:

* Phone Home:

Do you want us to email the latest prices ?

I am a registered member


[Sign In](#) or [Forget Password ?](#)

If you have any questions, can give us a message


Then choose your payment method and you are done!

Payment Method *

☐ Direct Deposit/BPAY

☒ Online Credit Card (via WestPac Bank Payway )

WestPac Bank Payway is a simple and secure way for paying your order. By using payway, transaction data are encrypted and protected via **SSL**. All Credit Card information is maintained and processed by the [WestPac Payway payment gateway](#). (A surcharge of 1.5% will be added to the total cost)

☐ PayPal 

PayPal is a simple and secure way for paying your order. By using paypal, transaction data are encrypted and protected via **SSL**. (A surcharge of 1.5% will be added to the total cost)

Courier *

☐ Fastway/CouriersPlease

☐ StarTrack (Australia wide)

☒ Australia Post (Australia wide)

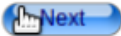
Postage cost = \$15.00

Australia Post offers nationwide delivery for small item only (No case or monitor). We accept only BPAY or Direct Deposit, Credit Card, **no COD**.

Fastway/CouriersPlease offers local or nationwide area delivery for all item sizes. We accept BPAY, Direct Deposit, Credit Card .

CouriersPlease deliver up to four times a day! Receiver must be present at the delivery address in order to accept the goods.

StarTrack Road Express offers nationwide delivery for all item sizes. We accept only BPAY, Direct Deposit or Credit Card, **no COD**, Receiver must be present at the delivery address in order to accept the goods



Using Your New Drive

To get the best use of your new hard drive, you should use it as your system drive. This means fitting the drive inside your computer, and re-installing Xubuntu.

You can do this by following the instructions from [scratch](#), making sure and copy your files over from your [back-up](#).

More RAM

RAM Benefits

Extra RAM will increase the number of tasks your computer can perform at the same time.

Finding the right kind of RAM is important. For best performance you should use the same kind of RAM you already have installed. In Workshop 01 we found the RAM type when [we removed it](#).

Buying RAM

Because RAM is small and light, it can be cheaper to buy large RAM sizes from overseas. These prices will change over time but as an example;

- a single 8 gig stick of RAM to fit your computer is about \$90 to buy locally ship to Townsville.
- The same product costs about \$85 to ship New Egg in the U.S.A.
- Two 8 gig sticks (16 gig total) costs about \$170 to buy locally ship to Townsville.
- Two 8 gig sticks (16 gig total) costs about \$150 to ship from the U.S.A

We will leave it to you to find the best RAM, just remember any RAM that breaks under warranty will need to be shipped back to where you bought it from.

Dedicated GPU

A dedicated GPU is an expansion card that uses a PCIe slot.

While your computer is not designed for gaming, a dedicated GPU card will go along way towards making a budget gaming PC.

Consideration are:

- PCIe slot - GPUs need a 16x PCIe slot. Does your computer have one?
- Form Factor - remember your computer is a low profile form factor? This means you need a GPU card that will fit, meaning a low profile card.
- Power Supply - GPUs are power hungry often needing a separate plug from the main PSU. Check if your computer has this option.

Fortunately, the most popular GPU maker NVIDIA has released a budget range of GPUs called the 1050 to suite these needs. You can read a very technical description on [Anandtech](#).

Buying a GPU

Once again, you can expect to get slightly cheaper prices by buying overseas. However, if your GPU fails, shipping it back overseas to be fixed can remove any savings made.

Software Resources

Troubleshooting

Googling is the quickest way to getting a solution, and most results will come from either:

- <https://askubuntu.com/>

- <https://ubuntuforums.org/>

As Xubuntu is based on Ubuntu, most problems and solutions are common across the two systems. Where you will find differences are in the desktop environment (desktop).

Just remember that Xubuntu uses the XFCE desktop when searching or asking for help and you will be off in the right direction.

Desktop Environments

If you would like to try another desktop you can always install it and switch between the two. Switching between desktops uses a desktop manager. Your Xubuntu system comes with LightDM installed. Some alternative desktops are;

- [lxde](#)
- [gnome 3](#)
- [mate](#)
- [KDE - Plasma](#)

Upgrading your Packages

Its good practice to upgrade your installed packages when possible. Xubuntu will prompt you to upgrade automatically with a GUI, but you can also upgrade manually with the 'Software & Updates' from the whisker menu.

Updating with the Command Line

This is as simple as updating your sources.

```
sudo apt-get update
```

Then upgrading packages

```
sudo apt-get upgrade
```

Upgrading your Distribution

Upgrading your distribution (distro) is the process of moving from one *version* of your OS to a more recent version.

Once a newer version of Xubuntu becomes available, you will be prompted to automatically upgrade.

This is a step to be considered carefully, as you may have software that does not work with more a new version of your OS.

Before You Upgrade

Before an upgrade, you should [backup your files](#) and do some [research](#).

As this workshop series is based on Xubuntu 14.04 LTS, a distro upgrade would go to the next LTS version, which is 16.04 LTS.

Upgrading with the GUI

The “Software & Updates” System Settings can be used to upgrade.

FOSS alternatives

https://docs.google.com/spreadsheets/d/1HzWrYLzyhrH641KWN6kxQG8v9RGRUi4ToOm4bzau_gg/edit#gid=0

Connecting Mobile Phones

iPhone resource;

<https://cloudcats.wordpress.com/2015/06/07/getting-xubuntu-to-recognize-your-iphone/>