# 2.01. Requirements

For mSuppy Mobile, refer Requirements

For more detailed configuration information on mSupply Client/Server setups please see this FAQ page

## Hardware requirements

### General hardware recommendations

We have clients running mSupply on a wide range of hardware in a wide range of operating environments. We are happy to discuss hardware options further - please contact support@msupply.foundation, but here are our general recommendations:

- In environments with regular power outages, which is most institutions using mSupply 😟, it is highly recommended to procure Laptop machines rather than desktop machines - refer to why we now recommend that you use laptops below.
- A connected printer is not absolutely necessary in every situation, but for most situations it is a requirement. A laser printer or an ink 'tank' printer is preferable.
- Buy hardware for which good after sales support is available.
- Buy brands with a reputation for quality (even if it means buying a slower/older machine).

### Windows and Mac hardware requirements

Hardware requirements vary widely depending on what you want to use mSupply for. Here's a rough guide:

| Machine | Technical Minimum | Recommended upgrades |
|---|---|---|
| Windows Client machine for use with server | 64 bit, i5 processor or equivalent<br>4 GB RAM, 50Mb of disk space<br>Windows 10 | i7+ processor or equivalent, 8+ GB RAM, 256GB+ of disk space |
| Mac Client machine for use with server. | 64 bit processor<br>macOS Mojave (10.14), 4 GB RAM, 50Mb of disk space | Mac OS 10.14.6 or later, 8 GB RAM |
| Windows central server<br>(Central server on a synced system) | i9 processor or equivalent, 32+ GB RAM, 4 x HDD/SDD volumes, 3 configured as RAID1 or RAID5 with hot spare plus daily backups to the fourth volume plus daily off-site backups\\Win Server 2016+ | Cloud hosted on a reputable service |
| Windows satellite server<br>(Satellite server) | 64 bit, i7 processor or equivalent, 8 GB RAM, 500 GB HDD/SDD volume with daily backups to an external volume plus daily off-site backups, Windows 10<br>Attached to a Smart UPS (see below) | i9 processor or equivalent, 32+ GB RAM, plus regular off-site backups\\Windows 10 |

| Machine | Technical Minimum | Recommended upgrades |
|---|---|---|
| Windows Single-User sync machine | 64 bit, i7 processor or equivalent, 8 GB RAM, 256GB HDD/SDD volume plus daily backups to an external volume plus daily off-site backups<br>Windows 10 | i9 processor or equivalent, 16+ GB RAM, 500GB HDD/SDD plus daily backups to an external volume plus daily off-site backups |

For a Terminal server, the general specification changes in that

- More RAM is needed.
- Hard disks are less important, as no data is stored on the server (unless you are using the same server for both hosting the mSupply server and hosting the terminal sessions).
- An additional Gigabit Ethernet port could be useful

If you are running a server that is not in a datacentre with proper power protection: Beware of Solid State Drives (SSDs) without Power Loss Protection!

At least one country using mSupply on servers in health facilities with SSDs installed has had the bitter experience of the SSDs failing after ungraceful shutdowns due to failing UPSes.

The vast majority of ICT documentation on the internet is written from and for locations enjoying relatively stable power supplies. When the above-mentioned experience happened, there was precious little information available for facilities suffering from the sort of chronic power supply issues which the majority of mSupply users experience. Now there is more literature - refer here : Surviving SSD sudden power loss

### We now recommend that you use laptops

Laptop machines, preferably with long battery life, will almost always be the best solution in terms of both cost and effectiveness. See below for the reasons why.

#### The problem with power cuts and UPSes

In our experience, the primary cause of mSupply database corruption is ungraceful shutdowns of the computer hosting the mSupply database. Ungraceful shutdowns occur when power to the computer is cut instantly, without any notification to the computer to shut down gracefully.

Ungraceful shutdowns on client computers will *not* result in mSupply database corruption. They may result in incomplete data record entry, but that can be rectified once power is restored.

A common mitigation to prevent ungraceful shutdowns is to use an Uninterruptible Power Supply (UPS). If the computer is protected by a normal UPS, then we can still have ungraceful shutdowns when the battery power runs out. A 'smart' UPS detects when the battery power is about to run out and sends a notification to software on the server which triggers a graceful shut down of the

computer. To enable this, there needs to be a cable connection (normally USB) between the UPS and the computer combined with software running on the computer. Even if the machine is protected by a smart UPS, there are a number of circumstances where this UPS protection fails:

- Cable becomes disconnected
- Software isn't configured correctly or doesn't start up
- UPS batteries degrade (normally within 2 years of installation in environments with regular power cuts) and there is too little capacity to run long enough for the computer to shut down gracefully after receiving the notification from the UPS

#### The merits of laptops

Laptop computers tend to be much more resilient to power failure:

- A laptop's built-in 'smart' UPS is very reliable
- The internal batteries last much longer than UPS batteries
- Even if the laptop internal battery degrades, the 'smart' function appears to work much more reliably than a standalone UPS communicating with a 'tower' computer.

Here are some additional advantages of laptops vs. desktop computers:

- Can be more resilient to hot and humid working environments if you buy the right model.
- Lower cost of freight:
  - To send the machine to site
  - To send spare parts for repair on-site
  - To retrieve the machine from site for any repairs that can not be undertaken on site

    There are countries using mSupply where the cost of sending a 40kg traditional server computer to the site is comparable to the purchase price of the server.

- Wi-Fi capability normally included without extra cost
- Bluetooth capability normally included without extra cost
- 'Sound card', speaker, earphones and video camera normally included without extra cost

#### Battery life

While the consequences of running out of battery power on a laptop is not as catastrophic as on a desktop machine, it is still good to be able to keep your mSupply system running through long power cuts. Unfortunately most laptop manufacturers don't advertise how long their batteries last, even if they do last a long time! Fortunately, there are websites with reviews on laptops where the battery life has been tested and reported.

#### Security

A concern with laptop computers is security. It is easier to steal a laptop computer from an office than it is to steal a desktop computer. For this reason, laptops are normally configured with a physical locking feature such as Kensington lock slot or Noble wedge lock slot. Don't buy a laptop without one

of these security lock features.

#### Keyboard

Because mSupply is dealing with lots of numbers (quantities of stock), it is highly recommended to have a keyboard with a numeric keypad. Smaller laptop computers (14“ screen or less) will not have this. Smaller laptop computers normally have an impractically small screen. It is therefore recommended to procure either:

- A laptop computer with a keyboard that includes a numeric keypad - which will necessarily entail a larger screen or
- A smaller laptop computer with an external keyboard, mouse and maybe even external screen. We don't recommend wireless external keyboard or mouse. Battery replacement is expensive and environmentally irresponsible.

### Backup system

Once you start using mSupply, it is of crucial importance that you have a method of backing up your data. mSupply stores all its data in a file that rapidly becomes large. You need, therefore, to have a high capacity removable storage device. We strongly recommend the use of an external hard disk using either firewire (IEEE 1394) or USB2 to facilitate off-site storage of backups.

- See the section in Preferences that covers mSupply's built-in backup features that allow backup to another disk, and to an internet backup site... you'll find it here: Backup
- If not using our internet backup service, you need to be able to store backed up data off-site to prevent the risk of loss by fire, theft, etc.

Sustainable Solutions will not be able to help you recover lost data in the event of hardware failure if no backup is available.

### Antivirus

Windows based operating systems are particularly prone to malware if precautions are not taken. We recommend the following precautions:

- Install a reputable anti-virus program, including web protection if the computer has access to the internet.
- Disable USB ports - refer to this site for suggested methods.

Ensure that access to passwords to allow exceptions to the above two measures are kept secure.

### Upgrading mSupply from previous versions

If you open a data file that was created with a previous version, it will automatically be updated to the new format. Please note that this process may take some time.

Note that if you are using a version earlier than v1.96 you must first upgrade to v1.96 and then to version 2 or 3.

IMPORTANT! Always make a backup of your data file before upgrading, and preferably keep a copy off-site. We will not be able to help you in the event of some unexpected disaster if you haven't followed this advice!

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