

# Commodity e-Exam USB Management Hardware Kit

This document provides an overview of how to combine commodity hardware components and software tools to create an e-Exam Administration station. This can be used to create new e-Exam USBs (one to many duplication) as well as to recycle batches of USBs between exams (copy and delete files).

*This document last updated 21 June 2019.*

## Recommended Equipment List

The following are all commodity components.

### Large, generic USB Hub:

- a) A 19 port USB3.0 hub with integrated power supply in a black metal enclosure box is US\$210 plus shipping from <http://eyeboot.com>. Request a plug to suit your country when ordering. This comes with USB Cable to connect to a computer. This hub has been used extensively by e-Exam HQ to burn e-Exam disk images to many batches of USBs and this has been found to work quickly and reliably.



Order from <https://www.eyeboot.com/19-port-40a-usb3-hub.html> be sure to ask for a plug to suit your country when ordering (e.g. Australian plug).

### USB sticks:

- b) Multiple USB sticks will be required. We advise that you test a range of brands, models and even colours before purchasing in bulk. Check that the USBs can burn an image to their full advertised capacity, that they can withstand repeated burning without degrading in speed, that the read and write speeds are high, that they don't dramatically overheat when used (it is normal that USBs will become warm when an image is burnt to them). We have previously used SanDisk Cruzer Switch 8GB USBs with great success (although now unavailable in the market). These USBs have withstood repeated image burning very well. We have also tried a limited number of 16GB variants although we have less experience with these. As a demonstration of the variation within even similar models - We have found that of the 8GB SanDisk Cruzer Switch the Red+Black or Pink Models are best in terms of speed. The green Models are moderately slower. The Blue versions are slow and not recommended. We do not recommend generic/no brand or 'your logo on a USB' products due to low quality components frequently being used.

### Computer:

- c) 1 x Apple laptop with standard two USB type A\* ports (rectangle shape) with minimum of 8GB of RAM – We recommend 16GB RAM.  
OR
  - d) 1 x Windows laptop with standard two USB type A\* ports (rectangle shape) with minimum of 8GB of RAM – we recommend 16GB RAM. Note! Windows should be a minimum of Windows 10 version 1703 or later (old versions of Windows cannot fully access multi-partition e-Exam USBs).
- \* Note: A USB-C to USB-A converter could be used - but we have not tested this.

### Software:

- e) A graphical user interface 'e-Exam Administrator' tool based within a generic Ubuntu Live USB. This works in a similar way as the e-Exam USB sticks in that it is a bootable USB stick. This is designed to be easy to use with a point and click interface. It should work on both Apple and Windows laptops as above.
  - Please get in touch to obtain the Admin tool disk image file that you can use to create your own e-Exam Admin USB.
  - An 'e-Exam Admin guide' is available that explains all functions needed to administer e-Exam USBs.

- f) Optional: e-Exam administration helper command line scripts for use in OSX/MacOS and Linux. These are an alternative to graphical user interface tool above. Available free from us, see <http://mirror.aarnet.edu.au/pub/eexams/> then look for the most recent version of the `eexam_management_scripts` file.
- g) Optional: Software to burn disk images to USBs:
  - 1) Etcher (100MB) cross platform software for Windows, Apple OSC/MacOS, Linux (opensource). A graphical user interface tool designed to burn a disk image to one USB. <https://www.balena.io/etcher/>
  - 2) ImageUSB (1.4MB) Windows only software (freeware from OSforensics). A graphical user interface tool designed to burn a disk image to one or more USBs. This software also allows the creation of a disk image from a USB stick. <http://www.osforensics.com/tools/write-usb-images.html>

#### Notes:

- 1) At this time we recommend laptops with standard USB Type A ports (rectangle shape) with 16GB of RAM.
- 2) The recommended 19 port USB3 USB hub can be purchased from [eyeboot.com](http://eyeboot.com). Last checked May 2019. Be sure to request a power plug to suit your country when ordering USB hubs (e.g. Australian three prong plug). It will ship to your door.
- 3) We recommend that you use the e-Exam Administration tool software (Live bootable USB version) to manage and administer USB sticks. Refer to the 'Admin Tool guide' documentation.

#### Further Advice

Further advice about e-Exam management is available from [transformingexams.com](http://transformingexams.com).

An extended discussion of other options for USB management hardware and large USB hubs is available in the 'Alternative admin guide' document.