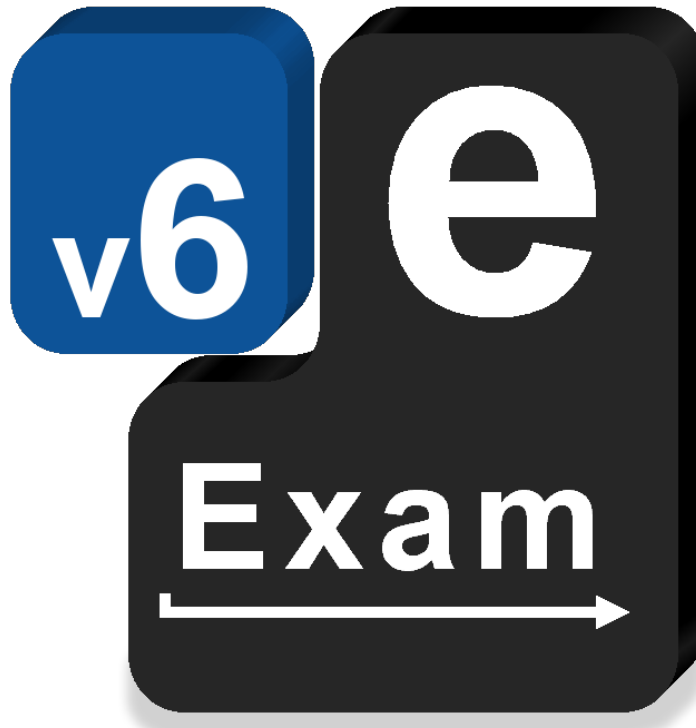# Laptops

e-Exam System v6

This document provides:

- o Quick guide to laptop requirements for students and administrators.

Acknowledgements

The e-Exam System version 5 and version 6 platform project is supported by an Australian Government grant. The project is being lead by Monash University in partnership with nine Australian Universities.

Project Team

Lead: Dr Mathew Hillier, Monash University
Collaborator: Dr Andrew Fluck, University of Tasmania (former lead to predecessor versions)

Technical Developer: Mr Martin Coleman (Monash University)

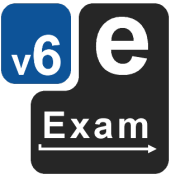Project Manager: Vilma Simbag (Monash University/University of Queensland).

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This is a work in progress! Last Updated 21 June 2019

* Note some features are still under development

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e-Exam System Laptops

The e-Exam System comprises of two USB stick components, an administration tool and a student client. Both are based on Linux 'live' USB sticks. The student and administration components have different minimum computer requirements. The student part has very minimal requirements. *Current as at 24 May 2019.*

Computer requirements

	For Students	For Administrators
Can start up from…	Must be able to boot from a standard USB Type A storage device (rectangle plug). See 'Quick start guide'.	Must be able to boot from a standard USB Type A storage device (rectangle plug). See 'Quick start guide'.
Processor	64bit Intel	64bit Intel
USB Type A ports: rectangle plug	Port 1 (required) for the e-Exam USB stick Port 2 (*optional*) for a wired mouse.	Port 1 (required) for the e-Exam USB stick Port 2 (required) for USB Hub to administer USB sticks, add mouse etc.
RAM required	Minimum: 2GB RAM. Recommended: 4GB RAM. Note: 8GB+ RAM may be required for advanced software (e.g CAD) and multimedia intensive exams.	Minimum 16GB RAM. ***Warning!*** Insufficient RAM capacity can result in incomplete/faulty disk images or faulty e-Exam USB stick production.
Mouse	Wired mouse recommended	Wired mouse recommended
Other	See 'Hardware compatibility' below.	See 'Hardware compatibility' below. See 'For Administrators only' below.

Hardware compatibility

1. e-Exam version 6 USB sticks and Admin tool USBs only boot computers with 64 bit Intel processors that have USB Type A ports (or using a USB-C to A converter).
2. These computers currently **do *not* work or may be unstable**:
    a) Computers with USB Type C ports may not work or may only partly function, even with adapters (e.g. recent Apple MacBooks). Some models may boot but may not work with WiFi*).
    b) Microsoft surface tablets/laptops. Some models may boot but may not work with WiFi*.
    c) Lenovo model '100s'.
    d) Computers with ARM or AMD processors.
    e) Computers that have '32bit only' processors (now very old!).
3. Computers with Windows 8 or 10 stickers on them may require extra steps to boot from a USB or to work properly with Admin USBs. Many such computers are configured to use Windows 'hybrid shutdown' which stands in the way of the booting of alternative operating systems. To boot from an e-Exam USB stick you must either:
    a) hold down SHIFT while choosing Restart from Windows in order to obtain access to boot from a USB.
    OR
    b) fully shut down the computer (i.e. cold shutdown) by holding down SHIFT while choosing Shutdown from Windows. Then use the boot key upon start up to select the USB stick.
4. Apple computers that contain the T2 chip that were introduced from 2018 need 'secure boot' to be disabled: Hold down Command+R at power-on. Then use Utilities > Startup Security Utility. Set 'Secure boot' to 'no security' & 'External boot' to 'allow'.

* WiFi issues may be overcome by using a compatible WiFi adapter, possibly in conjunction with a small USB hub (e.g. e-Exam USB + WiFi USB dongle used together). WiFi adapters that use RealTek chipsets have been found to work (e.g. TP-Link WN725n does work) – but always test to be sure.
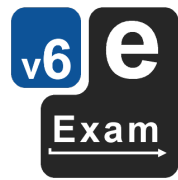
For administrators only

5. A USB hub (see recommended hub in the separate 'hardware guide').
6. USB sticks (blank USBs or existing e-Exam USBs).
    - Use USB storage devices at least 20% bigger than the source disk image file.
    - It is best that the USB stick is formatted as a single FAT32 partition to begin. Most new USB sticks tend to be so out of the box.
    - We strongly recommend testing different model USB sticks prior to purchasing in bulk for large-scale deployment. In particular check:
        - *True storage capacity*: Fake USBs can be present in the market that report a higher capacity than they actually have. E.g a 16GB stick may only have 1GB or less of real storage. This should not be a problem if purchased from reputable retailers.
        - *Degradation following repeated burns of full disk images*: i.e. burn a disk image to a USB, perform read/write speed tests. Re-burn an image to the USB, check read/write speeds. Repat several times to see if speeds are maintained.
        - *Read and write speeds*: these can vary greatly between USB stick models. We have found that there can be variations on the one model. E.g. different capacities, and even between different colours of the same size!
    - Resources, advice and USB testing tools:
    - Tools for Windows: https://www.raymond.cc/blog/test-and-detect-fake-or-counterfeit-usb-flash-drives-bought-from-ebay-with-h2testw/
    - Tools for Linux and Apple OSX/MacOS: http://oss.digirati.com.br/f3/ this latter requires command line knowledge.

Good luck :-)