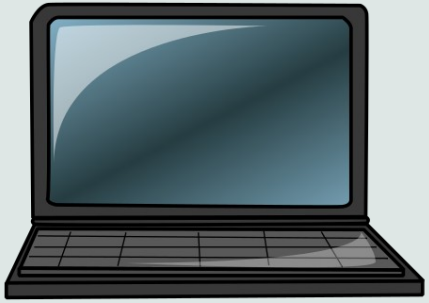
Booting Linux from a Live USB on a Windows 10 Computer

apcug
An International Association of Technology & Computer User Groups
Wednesday Workshop

Cal Esneault
9/21/2022

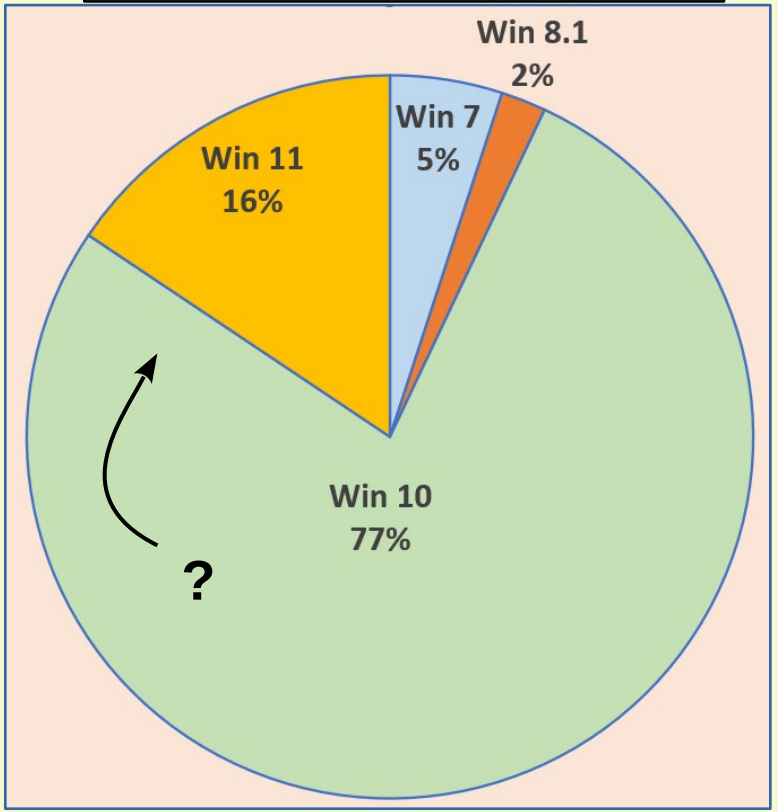


Linux

Background

- Windows 10 is the most used Windows OS version
  - Win 10 released 2015; free upgrades allowed from Win 7 (2009) and Win 8/8.1 (2012)
- Windows 11: released 2021; requires more recent hardware (CPU since ~ 2018, plus TPM)
  - Some Win 10 PC's will become "extra" with new Win 11 PC purchase; some Win 10 PC's upgrade
  - Some Win 10 PC's will not be upgradable (support ends in Jan 2025); expect many "extras"
- Converting "extra" Win 10 PC's to Linux extends their service life and minimizes e-waste
  - Example uses: file server, Linux learning tool, isolated unit for privacy/security, etc.

Windows Market Share by Version (Aug 2022, U.S.)



Source: Statcounter Web Analytics

Today's Presentation

(personal experience only, your situation can be different)

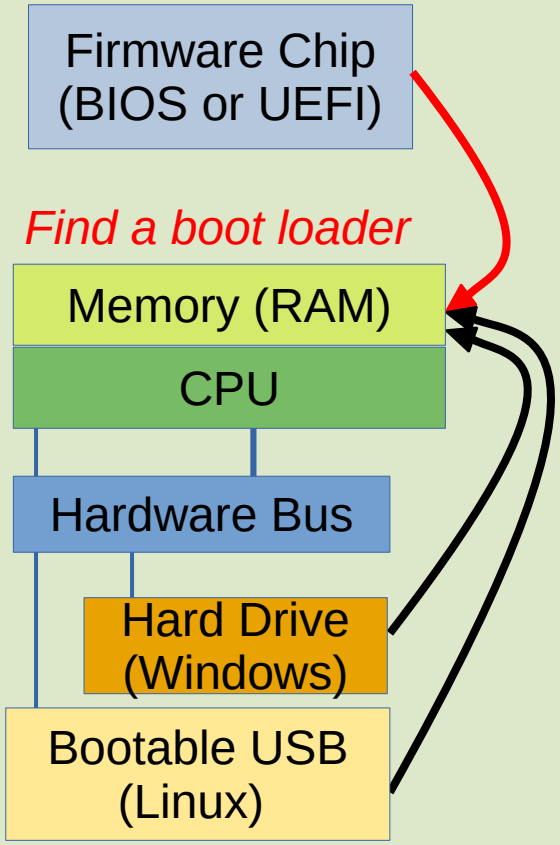
Objectives

- Focus on available "extra" PC's
  - x86 PC's running Windows 10
  - Not Windows 11, Chromebooks, Arm, Mac; not encrypted drives
- Temporary (no permanent changes)
  - No changes to current hard drive
  - Linux changes/files not saved
- Allow for Evaluations
  - Verify OS works on specific PC
  - Become familiar with Linux

Comments

- First, back-up your target PC
- Have bootable Linux USB (≥ 8 GB)
- Have Internet, WiFi connectivity
- Demo for today
  - Linux Mint 21
  - (also, Xubuntu 22.04 LTS)
- Proceed with caution (stop & investigate hardware irregularities); info provided here with no guarantees

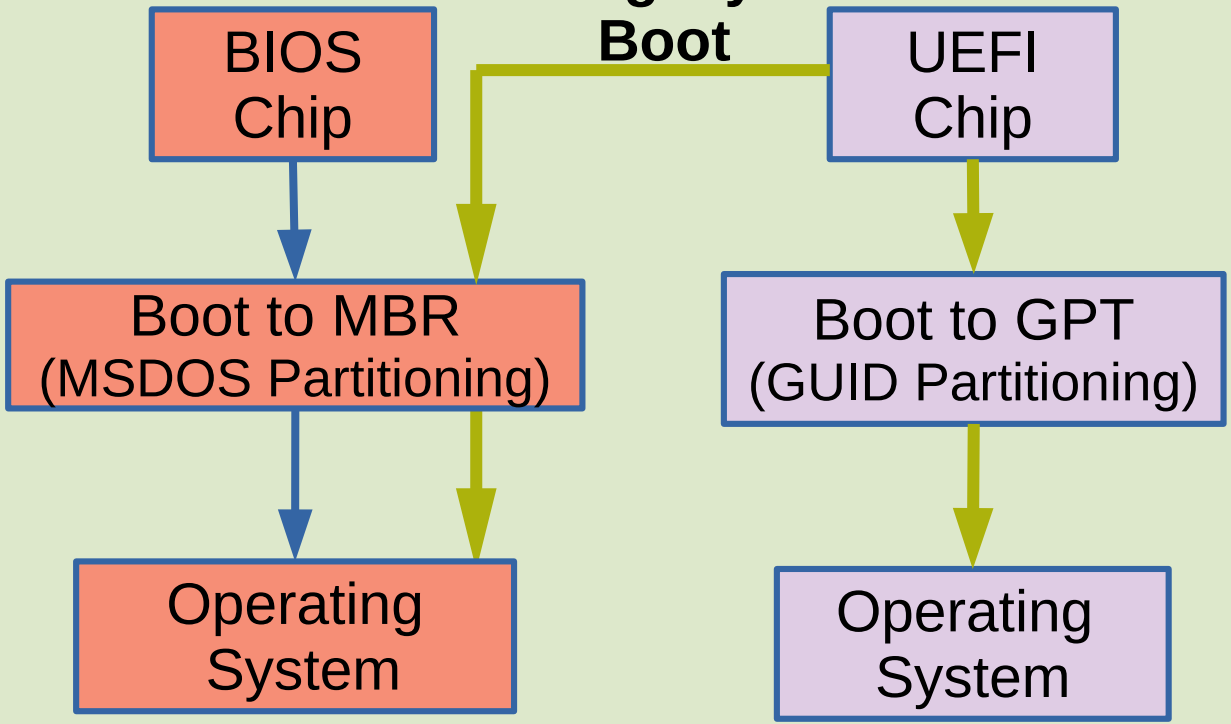
Boot Sequence (Load OS into RAM)



BIOS Boot

Legacy Boot

UEFI Boot



“Secure Boot” requires GPT;
”TPM” requires Secure Boot

To boot from live USB, shut down PC, insert live USB (or DVD)

immediately after re-start press **boot hot-key** and select proper media; continue with boot (or use BIOS/UEFI hot key as back-up)

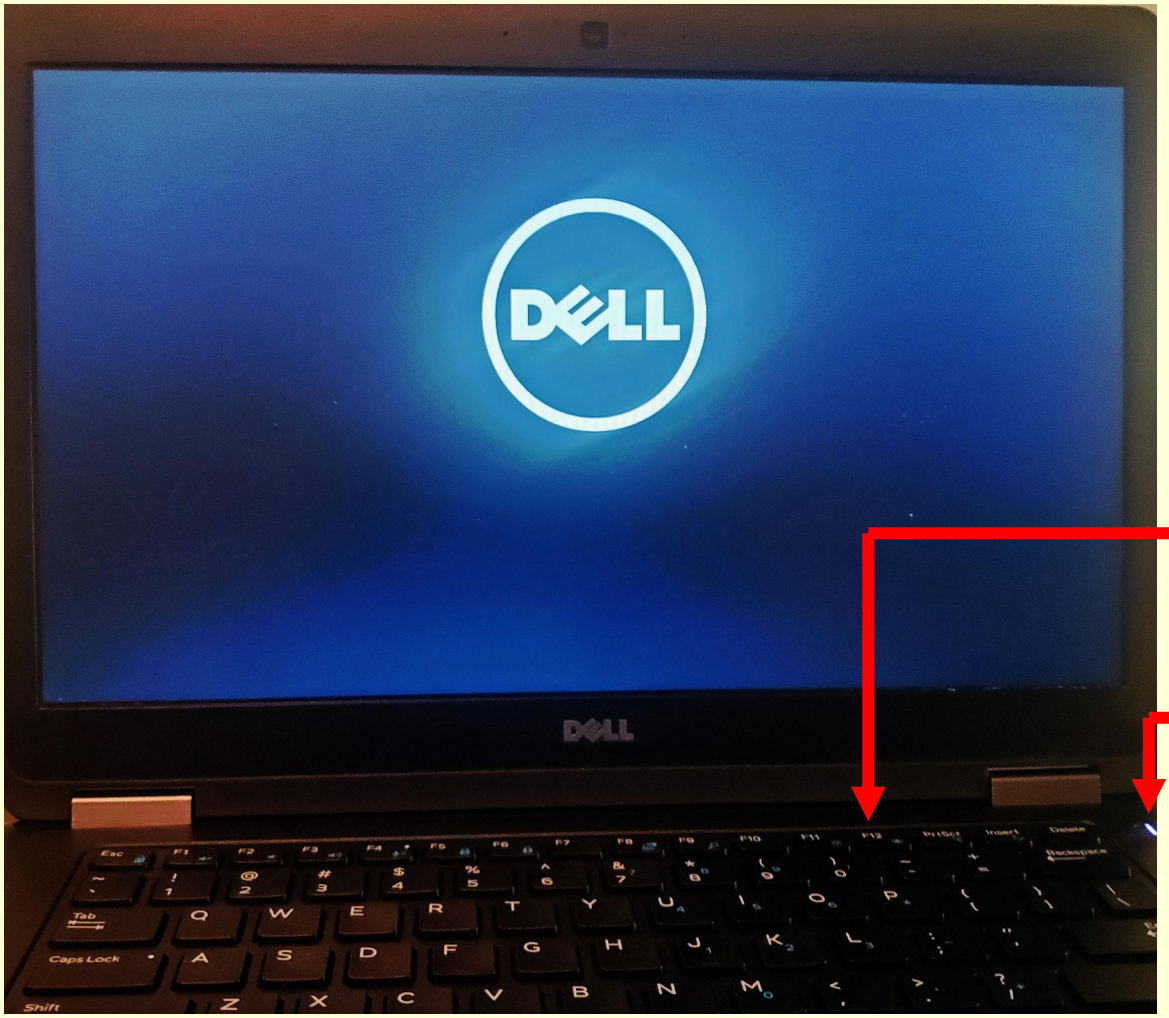
Below are typical boot-keys; search Internet for others

Laptop Manufacturer	Boot Menu key	BIOS or UEFI key
ASUS	ESC	F9
Dell	F12	F2
HP	ESC	ESC, F10
Lenovo	F12	F2
Toshiba	F12	F1, F2

Tested:
Dell Laptops
~ 4th - 6th Gen (Intel)
~ 2014 – 2017 mfg
All have UEFI chips
Operating Systems:
Windows 10, Ubuntu,
Linux Mint, Fedora

Live USB
Linux
Mint 21

When the display starts, immediately press and hold the boot menu key



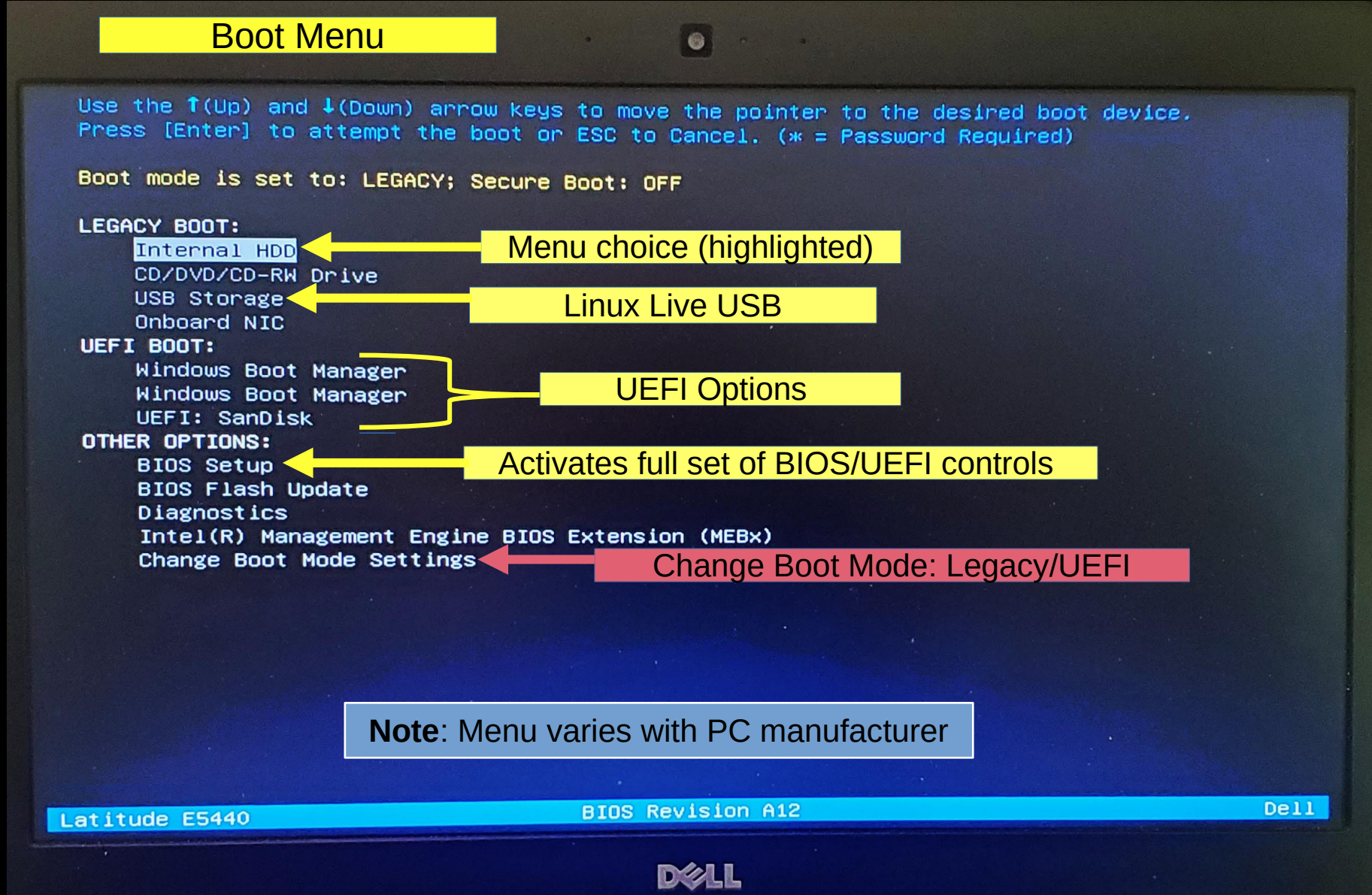
If your are successful, it interrupts start-up, prepares boot change menu

Message: “Preparing one-time boot menu”

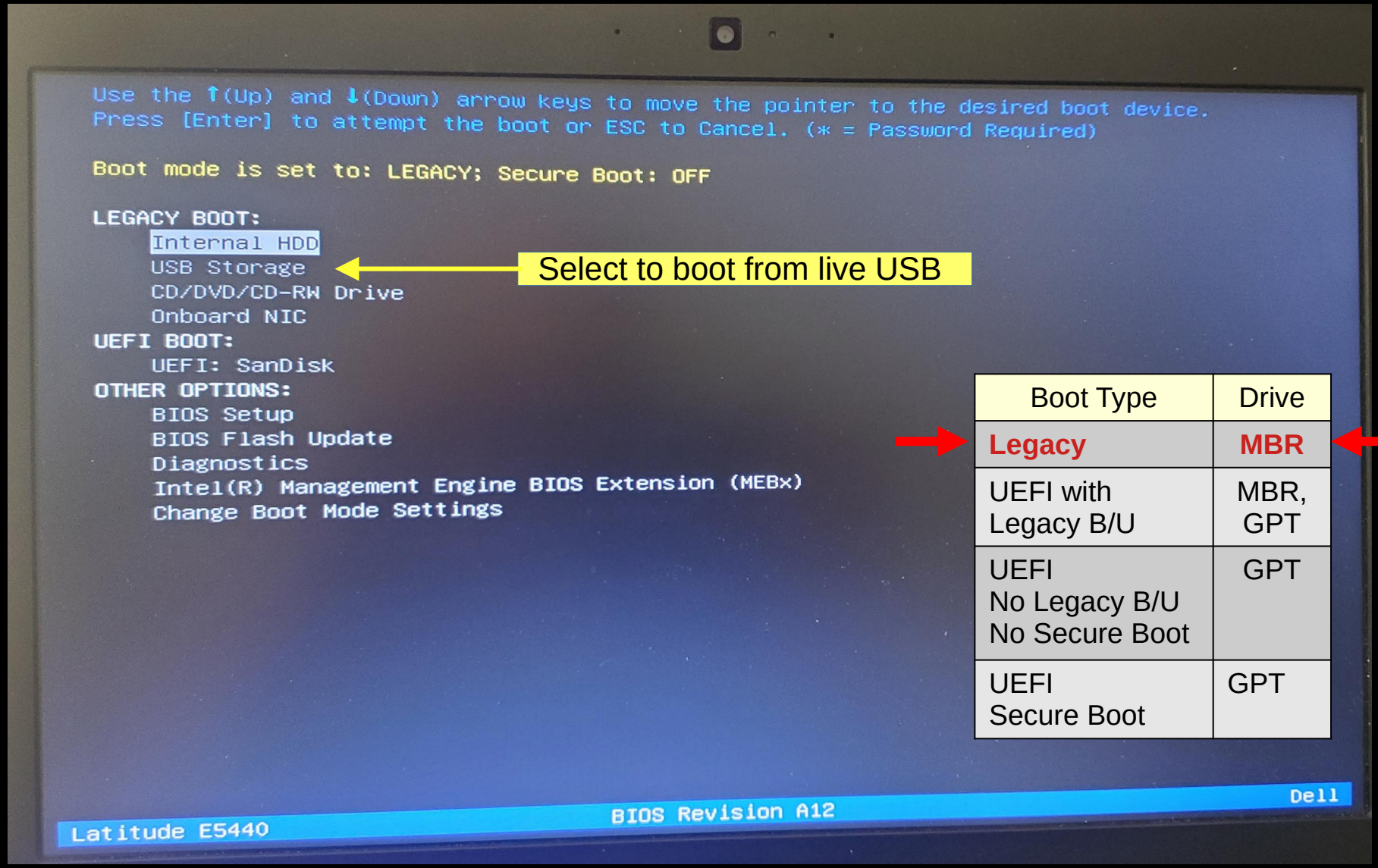
Progress bar

If it boots normally (fails to give the one-time boot menu), shut-down and try again

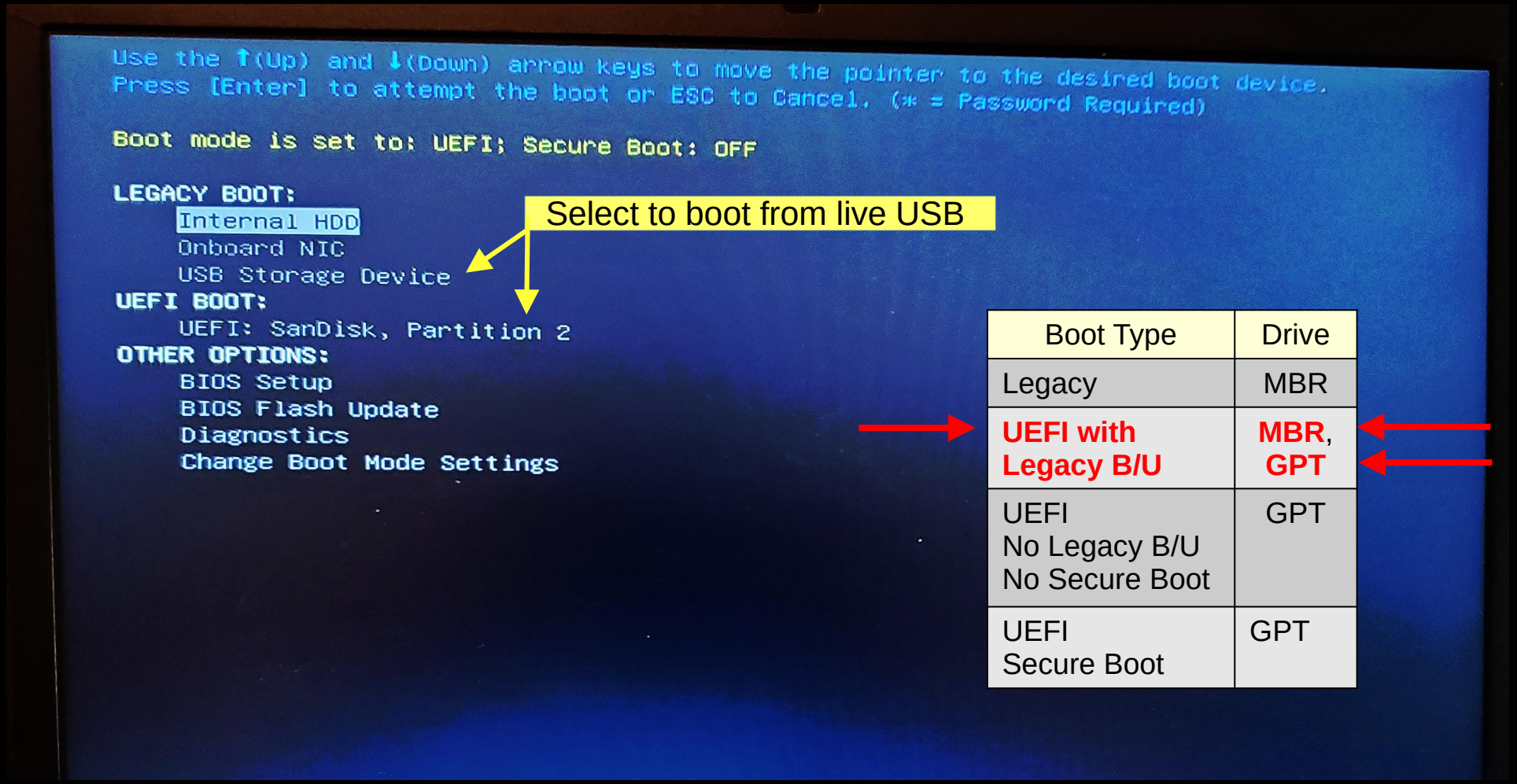
Boot Menu



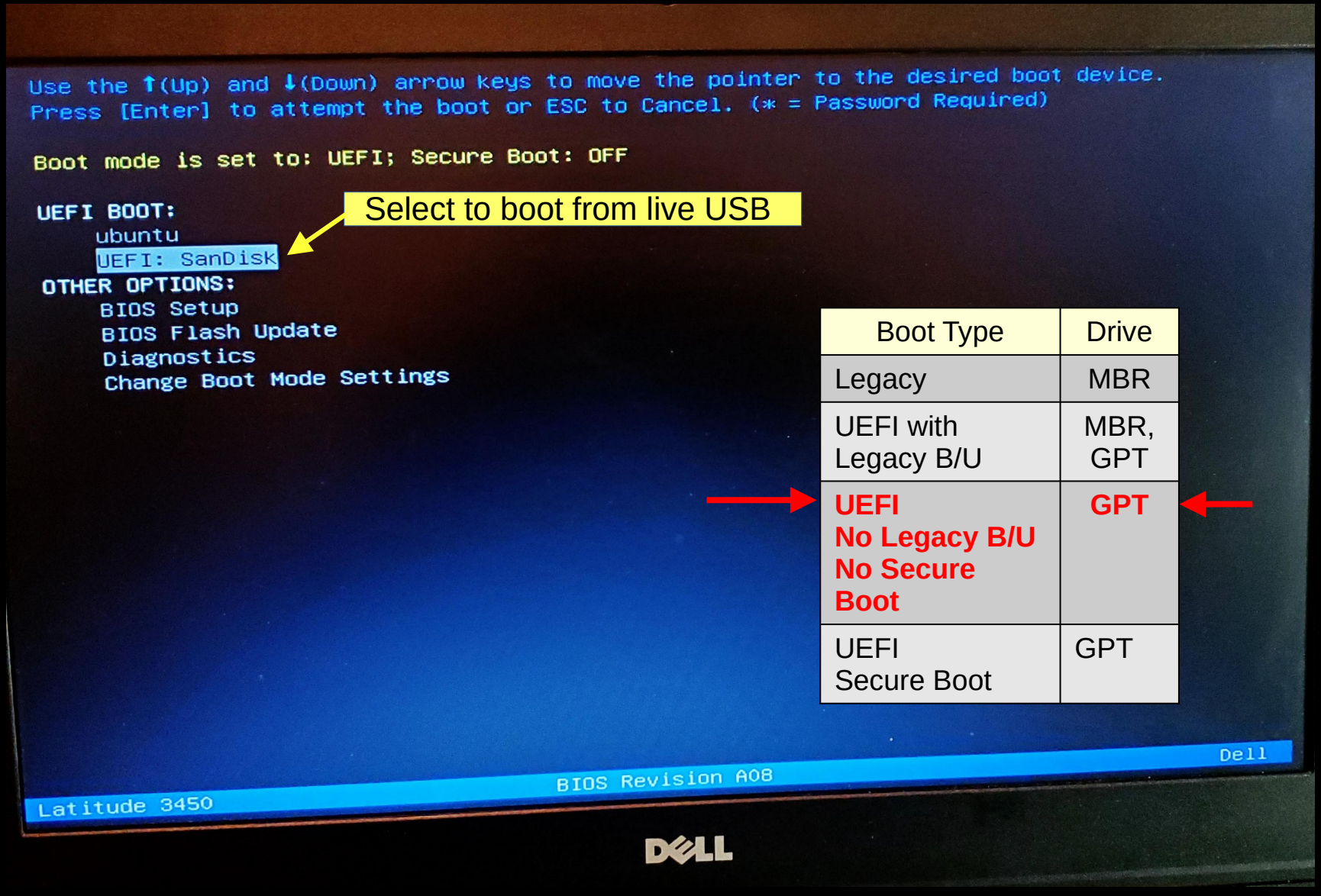
Note: Menu varies with PC manufacturer



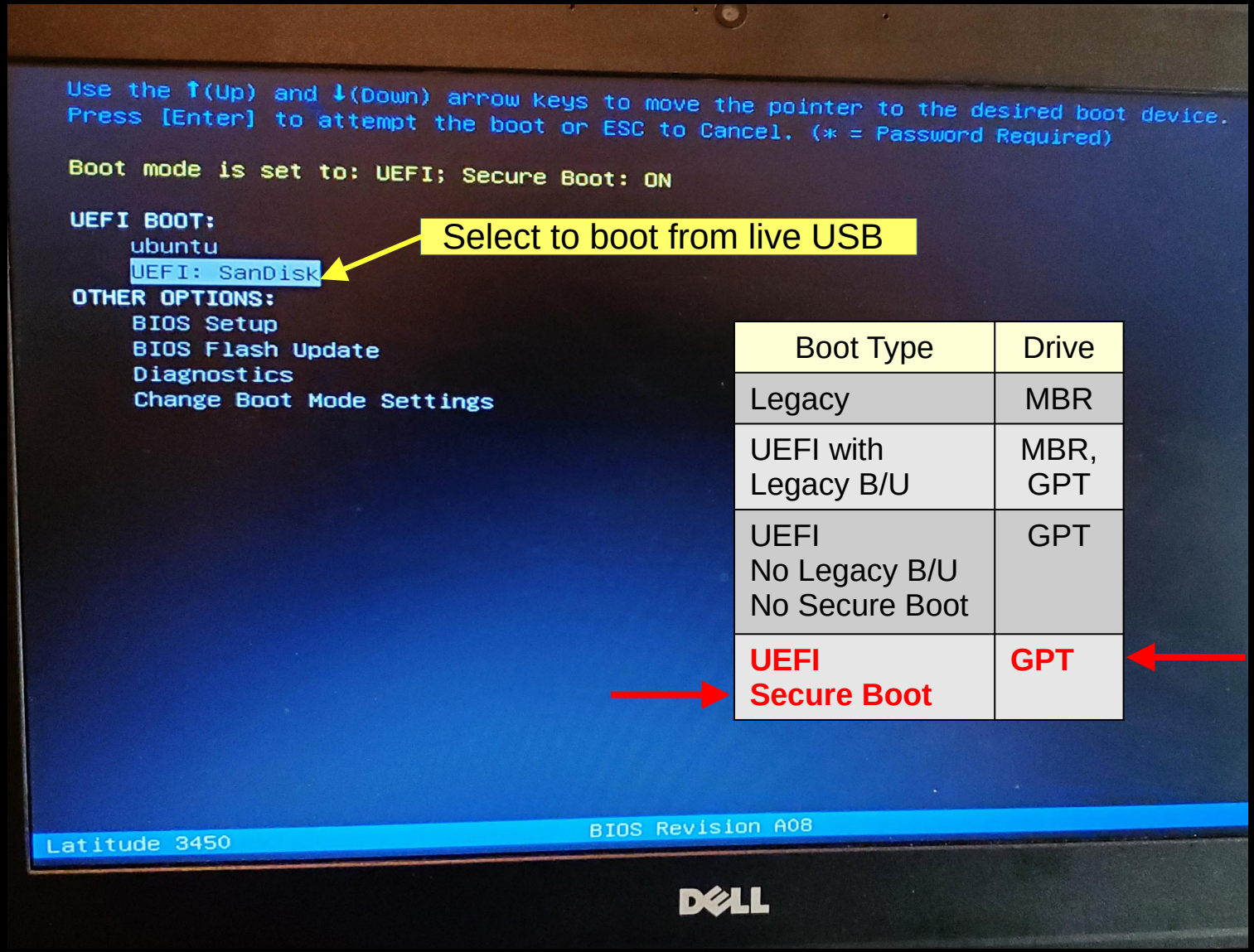
Boot Type	Drive
Legacy	**MBR**
UEFI with Legacy B/U	MBR, GPT
UEFI No Legacy B/U No Secure Boot	GPT
UEFI Secure Boot	GPT



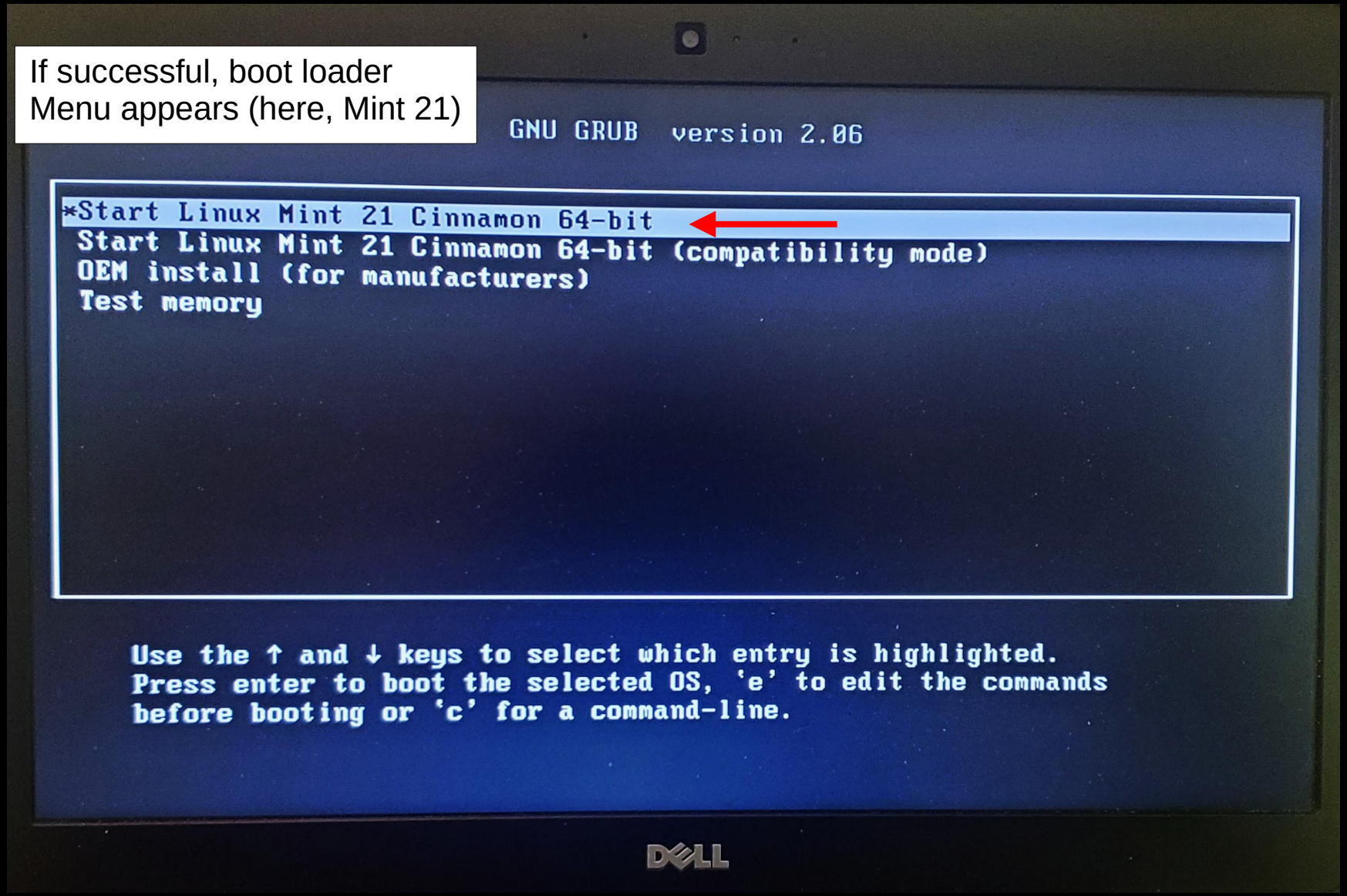
Boot Type	Drive
Legacy	MBR
UEFI with Legacy B/U	**MBR, GPT**
UEFI No Legacy B/U No Secure Boot	GPT
UEFI Secure Boot	GPT

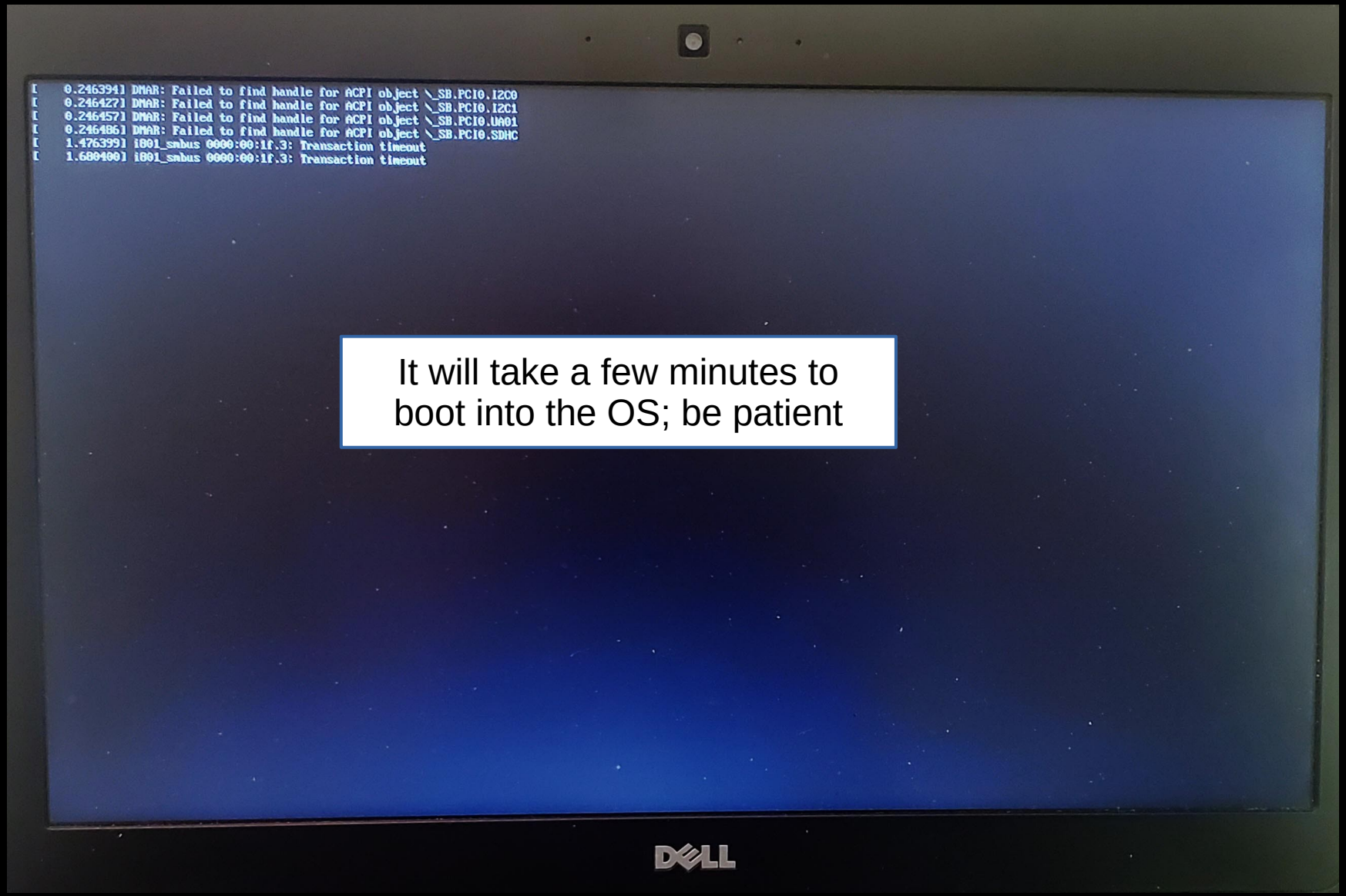


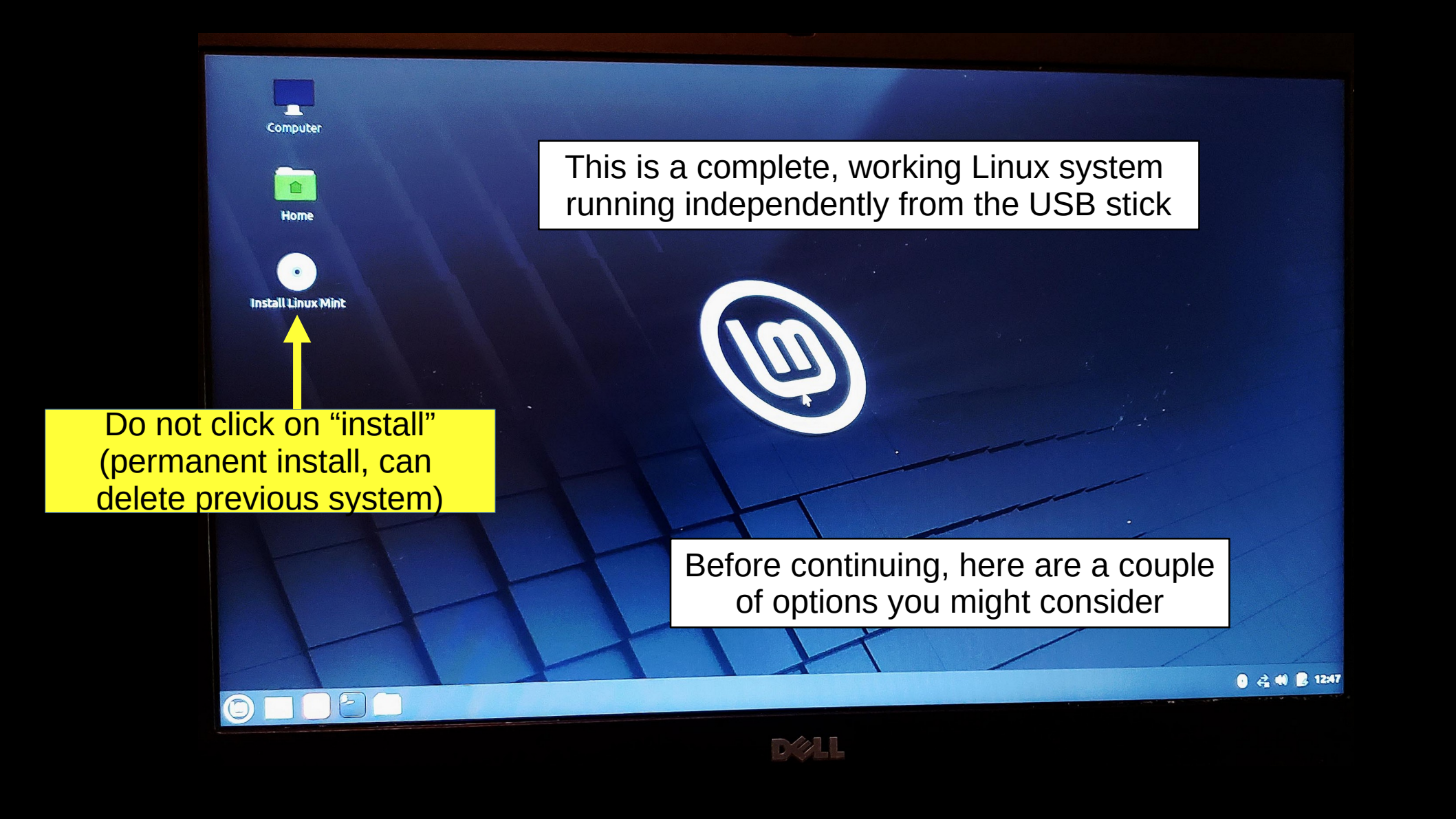
Boot Type	Drive
Legacy	MBR
UEFI with Legacy B/U	MBR, GPT
UEFI No Legacy B/U No Secure Boot	**GPT**
UEFI Secure Boot	GPT



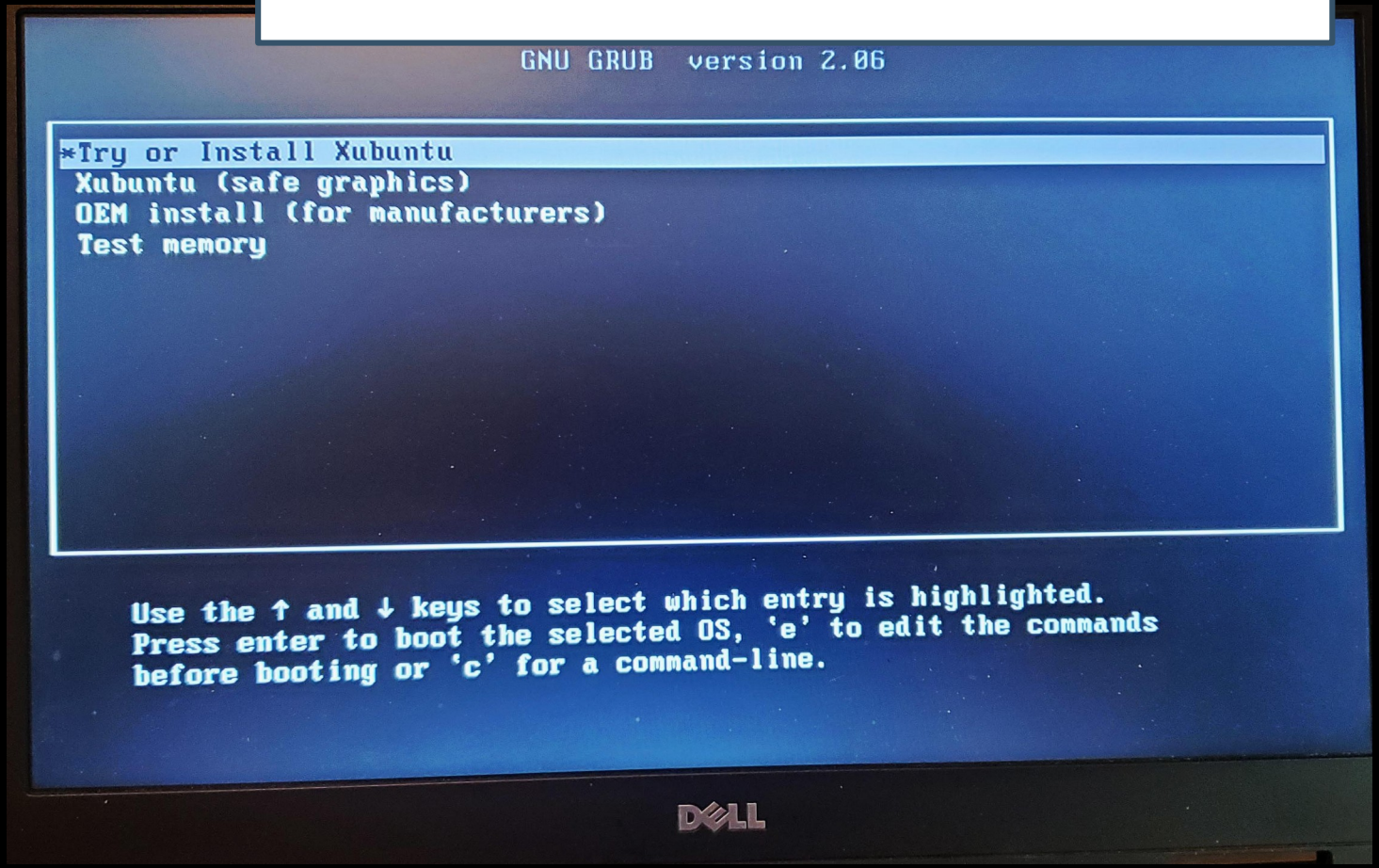
Boot Type	Drive
Legacy	MBR
UEFI with Legacy B/U	MBR, GPT
UEFI No Legacy B/U No Secure Boot	GPT
UEFI Secure Boot	**GPT**

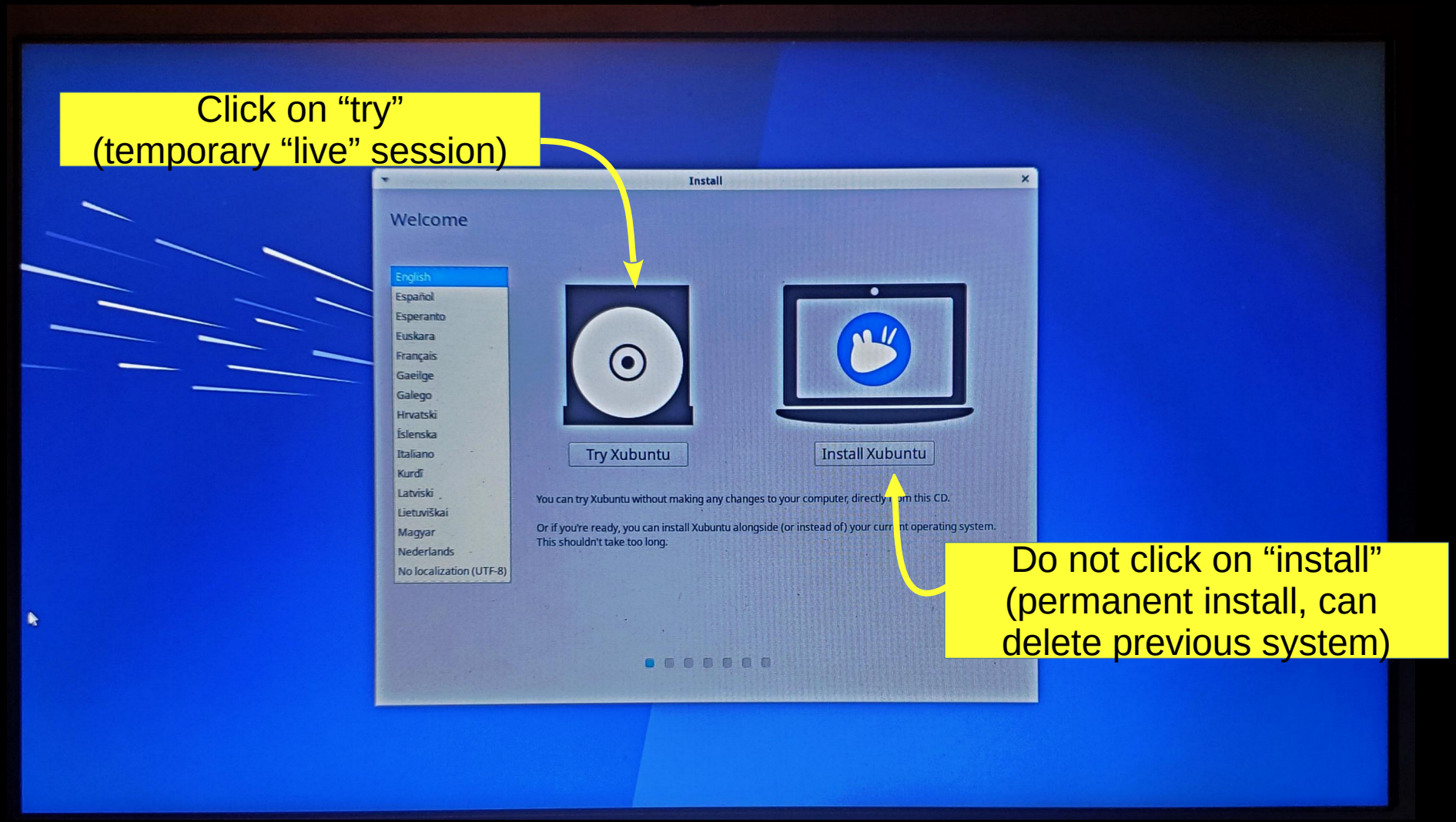

If successful, boot loader
Menu appears (here, Mint 21)
GNU GRUB version 2.06
*Start Linux Mint 21 Cinnamon 64-bit
Start Linux Mint 21 Cinnamon 64-bit (compatibility mode)
OEM install (for manufacturers)
Test memory
Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the commands
before booting or 'c' for a command-line.
DELL


[0.246394] DMAR: Failed to find handle for ACPI object _SB.PCI0.I2C0
[0.246427] DMAR: Failed to find handle for ACPI object _SB.PCI0.I2C1
[0.246457] DMAR: Failed to find handle for ACPI object _SB.PCI0.UA01
[0.246486] DMAR: Failed to find handle for ACPI object _SB.PCI0.SDHC
[1.476399] i801_smbus 0000:00:1f.3: Transaction timeout
[1.680400] i801_smbus 0000:00:1f.3: Transaction timeout
It will take a few minutes to boot into the OS; be patient
DELL

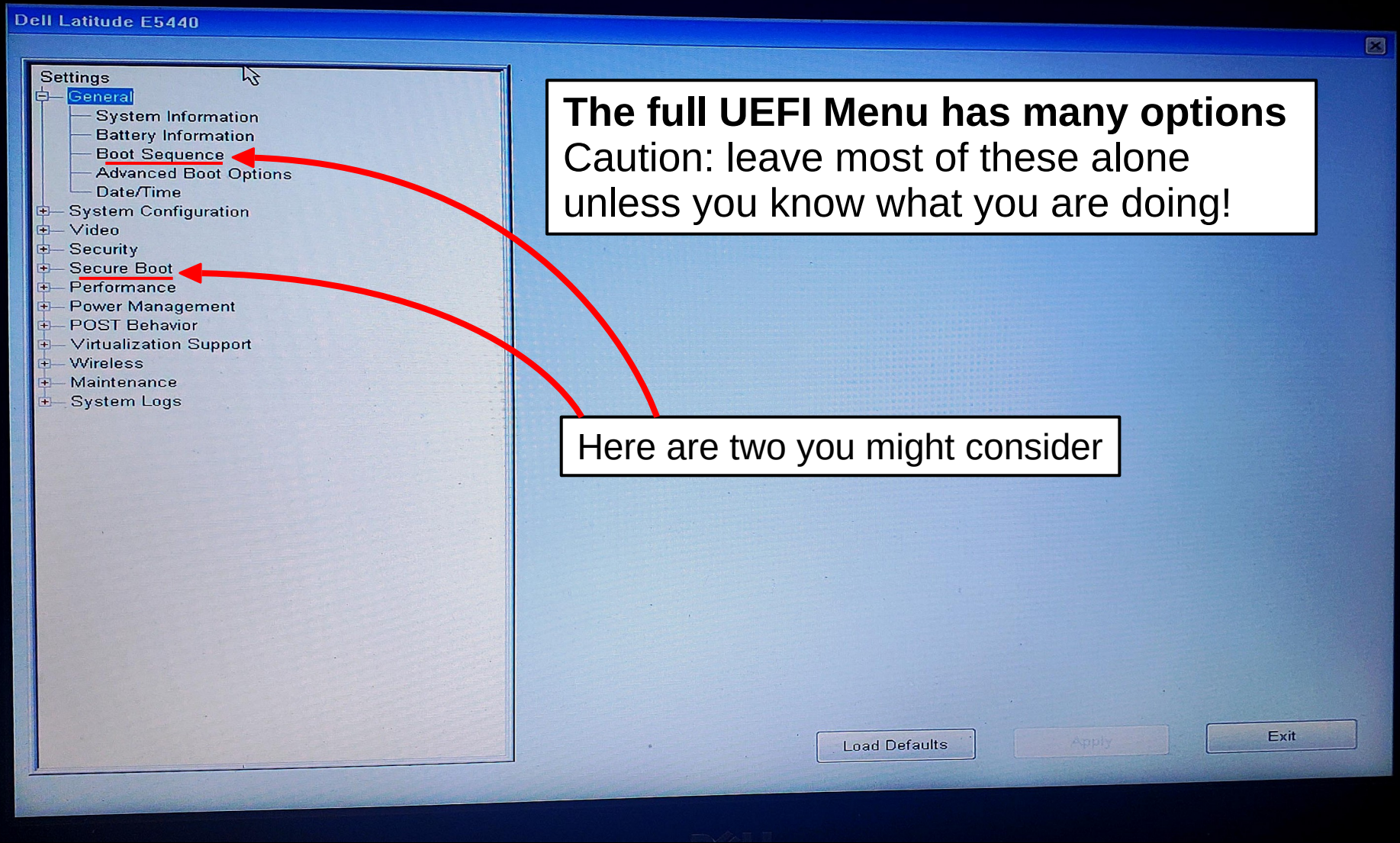

Computer
Home
Install Linux Mint
This is a complete, working Linux system running independently from the USB stick
Do not click on “install” (permanent install, can delete previous system)
Before continuing, here are a couple of options you might consider
12:47
DELL

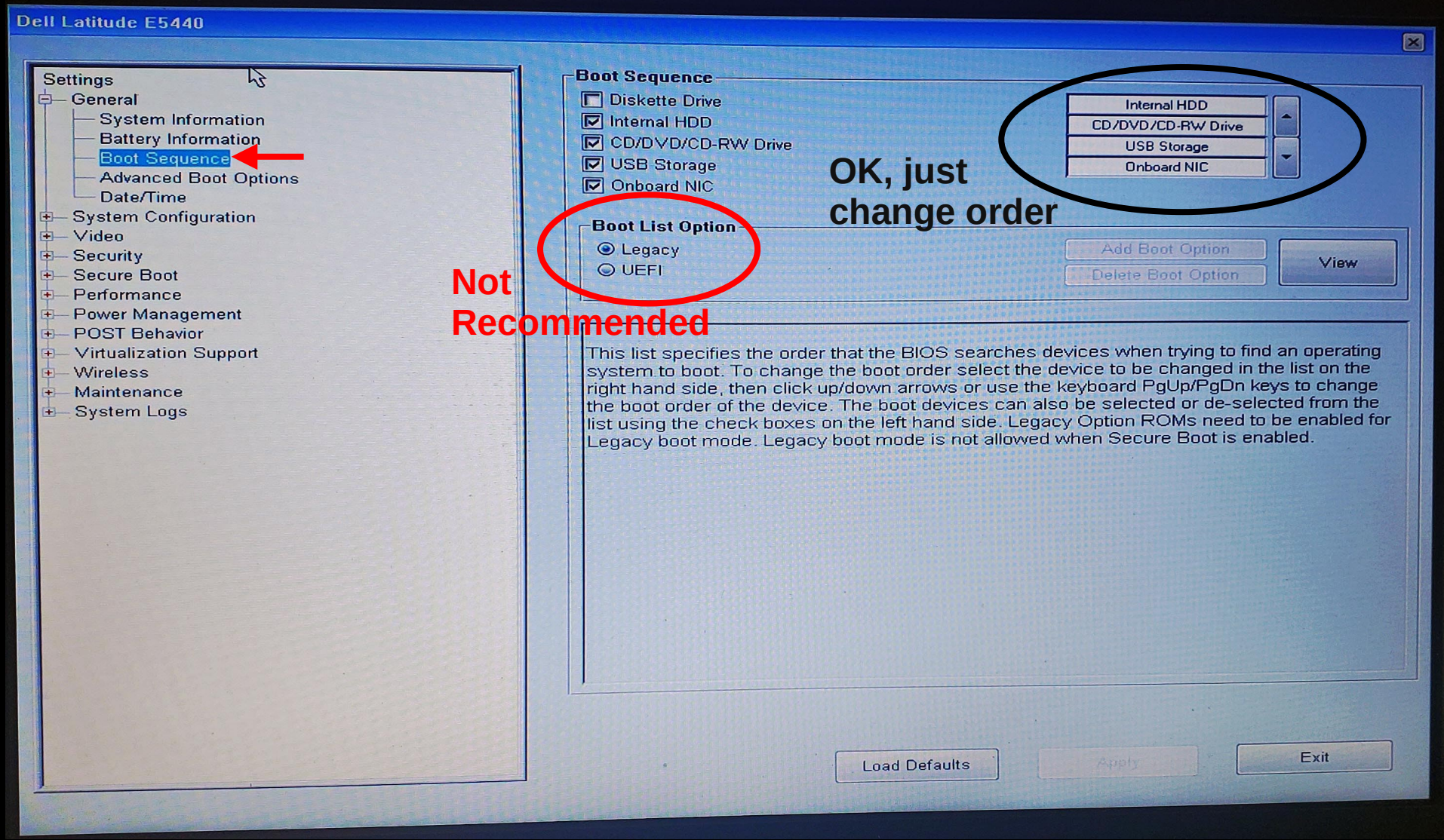
Alternative OS for Live USB: Xubuntu 22.04 LTS
Medium-Lightweight option for lower-power PC's
(< 4 GB RAM, < 40 GB hard drive, slow CPU)

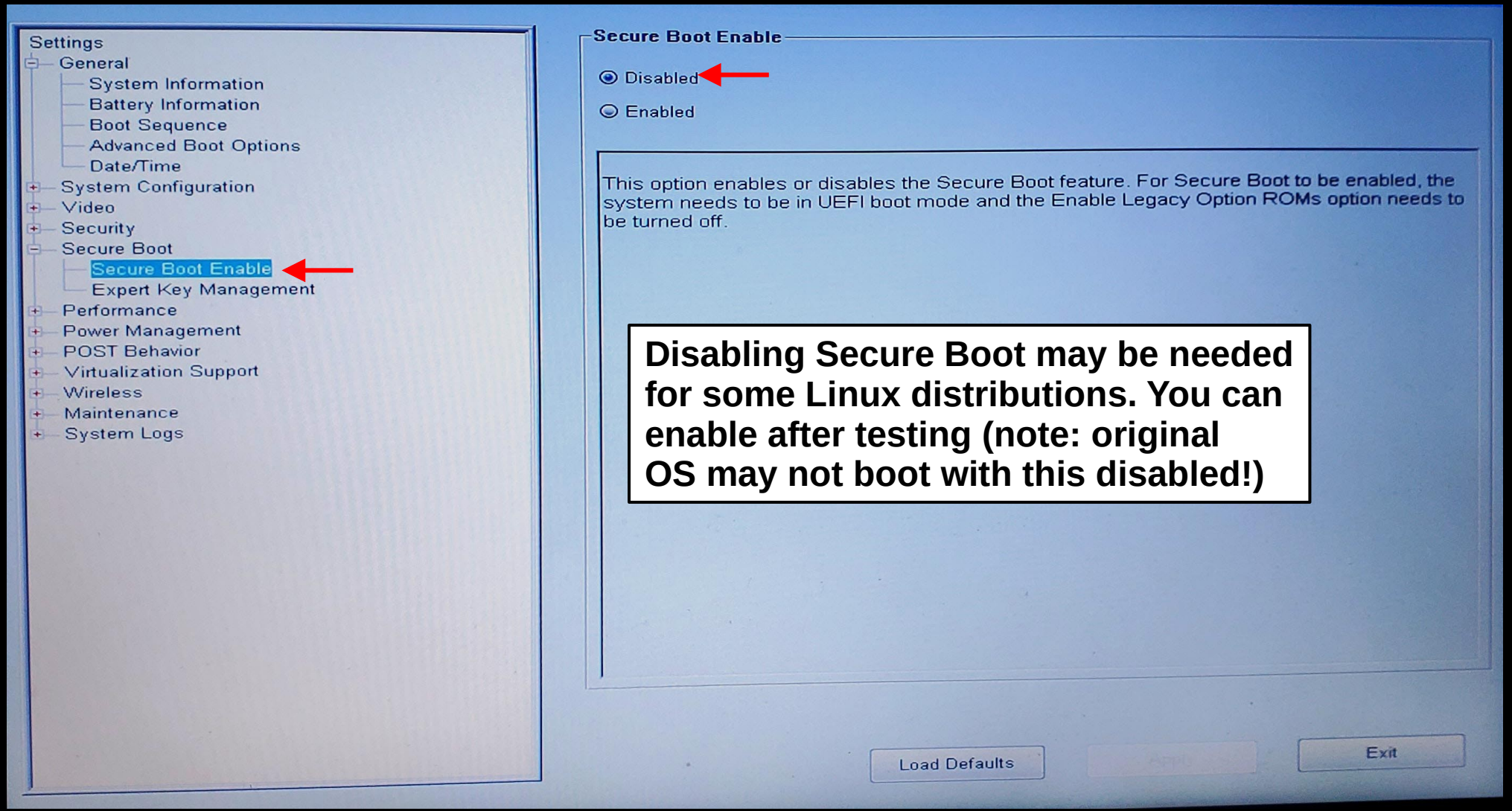



Click on “try”
(temporary “live” session)
Install
Welcome
English
Español
Esperanto
Euskara
Français
Gaeilge
Galego
Hrvatski
Íslenska
Italiano
Kurdî
Latviski
Lietuviškai
Magyar
Nederlands
No localization (UTF-8)
Try Xubuntu
Install Xubuntu
You can try Xubuntu without making any changes to your computer, directly from this CD.
Or if you're ready, you can install Xubuntu alongside (or instead of) your current operating system.
This shouldn't take too long.
Do not click on “install”
(permanent install, can
delete previous system)


03 Sep, 14:10
Trash
Home
Install Xubuntu 22.04.1 LTS
This is Xfce desktop; you can verify operations analogous to Mint 21


Dell Latitude E5440
Settings
General
System Information
Battery Information
Boot Sequence
Advanced Boot Options
Date/Time
System Configuration
Video
Security
Secure Boot
Performance
Power Management
POST Behavior
Virtualization Support
Wireless
Maintenance
System Logs
The full UEFI Menu has many options
Caution: leave most of these alone unless you know what you are doing!
Here are two you might consider
Load Defaults
Apply
Exit


Dell Latitude E5440
Settings
General
System Information
Battery Information
Boot Sequence
Advanced Boot Options
Date/Time
System Configuration
Video
Security
Secure Boot
Performance
Power Management
POST Behavior
Virtualization Support
Wireless
Maintenance
System Logs
Boot Sequence
Diskette Drive
Internal HDD
CD/DVD/CD-RW Drive
USB Storage
Onboard NIC
Internal HDD
CD/DVD/CD-RW Drive
USB Storage
Onboard NIC
OK, just change order
Boot List Option
Legacy
UEFI
Not Recommended
Add Boot Option
Delete Boot Option
View
This list specifies the order that the BIOS searches devices when trying to find an operating system to boot. To change the boot order select the device to be changed in the list on the right hand side, then click up/down arrows or use the keyboard PgUp/PgDn keys to change the boot order of the device. The boot devices can also be selected or de-selected from the list using the check boxes on the left hand side. Legacy Option ROMs need to be enabled for Legacy boot mode. Legacy boot mode is not allowed when Secure Boot is enabled.
Load Defaults
Apply
Exit


Settings
General
System Information
Battery Information
Boot Sequence
Advanced Boot Options
Date/Time
System Configuration
Video
Security
Secure Boot
Secure Boot Enable
Expert Key Management
Performance
Power Management
POST Behavior
Virtualization Support
Wireless
Maintenance
System Logs
Secure Boot Enable
Disabled
Enabled
This option enables or disables the Secure Boot feature. For Secure Boot to be enabled, the system needs to be in UEFI boot mode and the Enable Legacy Option ROMs option needs to be turned off.
Disabling Secure Boot may be needed for some Linux distributions. You can enable after testing (note: original OS may not boot with this disabled!)
Load Defaults
Exit

Verify Linux Operation

- Launch key operation
- Window Controls
  - Maximize, Unmaximize
  - Minimize, close
- System Settings
  - Display OK? Mouse: LH, RH
  - Power (Inactive time interval)
  - System Info (verify what exists)
- Desktop Background(from desktop)
- Network icon: Check/make connection
- System Reports (Sys Info); Disks
- Settings Manager
  - Applets: Workspace switcher, Expo
  - Date/Time
  - Check extra display
- Launch Firefox
  - Initial set-up; Check function
  - Download video
  - Check sound (sound settings)
- Check LibreOffice
  - Check Printer with “Writer” note
- Software Manger
  - Add MC, Add Chrome (optional)