

Introduction to Configuration

Chapter 4

This presentation covers:

- > Qualities of a Good Technician
- > Configuration Overview
- > Motherboard Battery
- > Hardware Configuration Overview
- > Troubleshooting Configurations

Qualities of a Good Technician

“Soft skills” as they are known across many industries
are essential

One Thing at a Time

- > Avoid the “gun slinger” approach
- > Put thought into methods or consider other possible resolutions
- > Avoid changing multiple things simultaneously
 - > E.g., if there is no display on the output, the technician might swap out the monitor, disable the onboard video port, add a new video adapter, power on the computer, and, when output appears, call the problem “solved”
- > If a computer problem is repaired using such a technique, the technician never knows exactly what solved the problem

Configuration Overview

The system Setup program or operating system, enables you to configure the motherboard, power, and devices.

BIOS Overview

- > The basic input/output system (BIOS) is commonly soldered to the motherboard
- > The BIOS has the following functions:
 - > Holds and executes power-on self-test (POST)
 - > Holds a basic routine called a bootstrap program
 - > Holds Setup
 - > Turns control over to an adapter's onboard BIOS

The Setup Program

- > Setup software is built into the system BIOS chip on the motherboard
- > During the boot process, most computers specify which keystroke(s) will launch the Setup program
- > A message will be shown and is usually in one of the four screen corners
- > The keystroke can be one or more keys pressed during startup
 - > ESC, Insert, Delete, F1, F2, or F10 keys
 - > Key combination is Ctrl + Alt + some other key

Flash BIOS

- > Most common type of BIOS
- > Allows changing the BIOS without installing a new chip or chips
- > Do one of the following to determine the current BIOS version:
 - > Watch the computer screen as it boots
 - > Enter BIOS Setup using a particular keystroke during the boot process
 - > From within Windows 8, access BIOS Setup by accessing *Settings > Change PC Settings > Update and recovery > Recovery > Restart now* > From within Advanced startup, select *Troubleshoot > Advanced options > UEFI Firmware Settings > Restart > App Menu > Setup*

Flash BIOS, cont'd

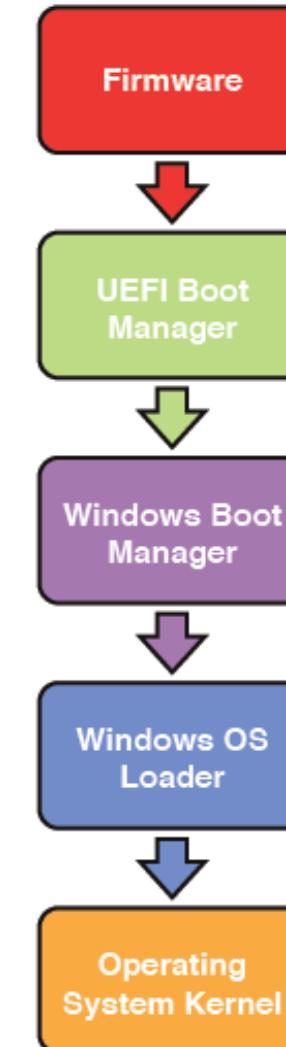
- > To access BIOS in Windows 10, within the Notification area, select *Action Center > All Settings > Update and Security > Recovery > Advanced startup > Restart now*
- > An upgrade of the BIOS normally involves removing all BIOS settings stored in CMOS and the BIOS software
- > Two things should be done before upgrading the flash BIOS
 - > Back up current CMOS settings
 - > Back up the current BIOS

Flashing the Bios

- > The flash BIOS can be upgraded
- > This process is “flashing the BIOS”
- > A computer may need a BIOS upgrade for a variety of reasons:
 - > To provide support for new or upgraded hardware such as a processor or a faster USB port
 - > To provide support for a higher-capacity hard drive
 - > For increased virus protection
 - > For optional password protection
 - > To solve problems with the current version
 - > To provide a security patch
 - > To reduce the time a computer takes to boot

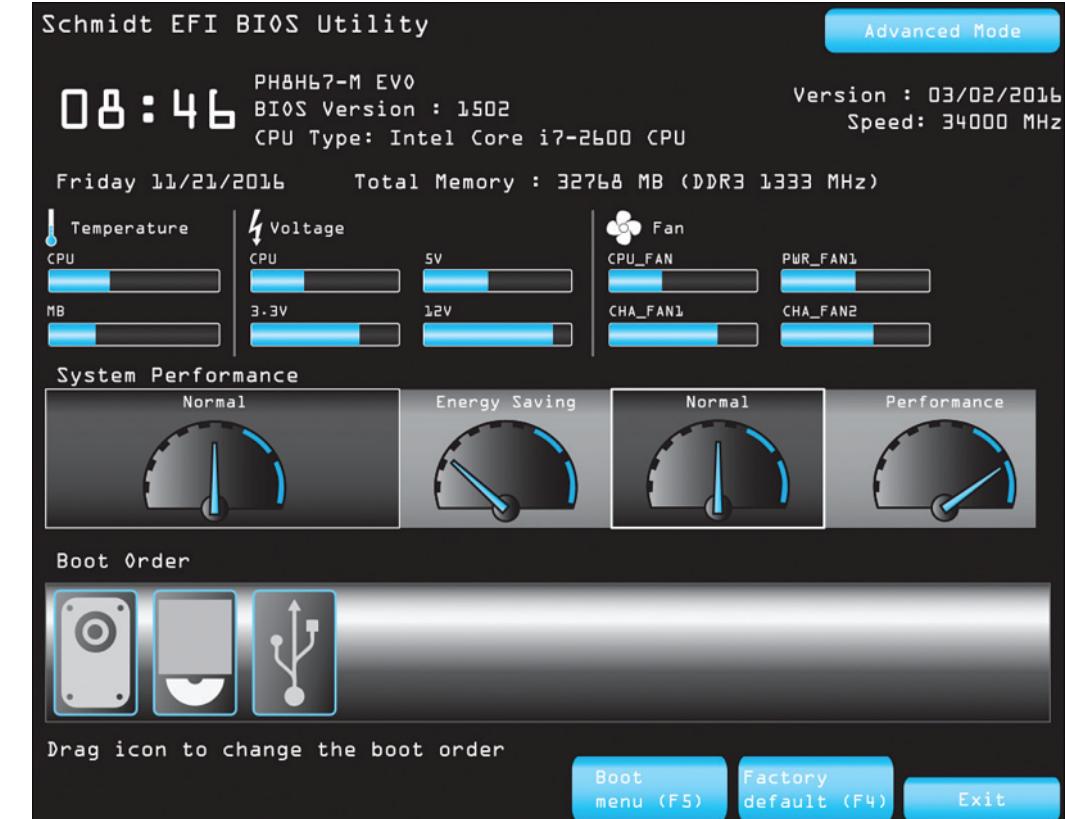
UEFI (Unified Extensible Firmware Interface)

- > Also known as simply EFI
- > Interface between the operating system and firmware
- > UEFI fixed original BIOS issues



UEFI (Unified Extensible Firmware Interface)

- > Unlike the original BIOS environment, you can use your mouse and possibly do some of the following:
 - > Connect to the Internet
 - > Run applications
 - > Run a virus
 - > Scan
 - > Have a GUI environment
 - > Execute utilities
 - > Perform a backup or a restore



Sample UEFI Main Menu

CMOS Memory

- > Settings changed in system BIOS are recorded and stored in complementary metal-oxide semiconductor (CMOS) found in the motherboard chipset
- > Memory that requires a small amount of power, provided by a small coin-sized lithium battery when the system is powered off
- > The memory holds the settings configured through BIOS



Clearing CMOS

- > Resetting all BIOS settings to factory default is clearing the CMOS
- > Clearing the CMOS is not the same as flashing the BIOS
- > One specific CMOS setting that is sometimes cleared is the power-on password

Other Configuration Parameters

- > Other possible parameters contained and set via the Setup program or operating system are:
 - > Interrupt Requests (IRQs)
 - > Input/output (I/O) addresses
 - > Direct memory access (DMA) channels
 - > Memory addresses
- > These parameters are assigned to individual adapters and ports, such as disk controllers, and the USB, serial, parallel, and mouse ports

IRQ

- > Multiple devices often want the attention of the CPU
- > An orderly process must be configured:
 - > An interrupt request numbers are assigned to the keyboard and the mouse
 - > Every device requests permission to do something by interrupting the processor
 - > The CPU has a priority system to handle such situations

PCI/PCIe Interrupts

- > PCI/PCIe devices use interrupts called INTA, INTB, INTC, INTD, and so on
 - > When a PC first boots, the operating system discovers what AGP, PCI, and PCIe adapters and devices are present and the system resources each one needs
 - > The operating system allocates resources such as an interrupt to the adapter/device
 - > If the adapter or device has a ROM or flash BIOS chip installed that contains software that initializes and/or controls the device, the software is allowed to execute during the boot process

I/O (Input/Output) Addresses

- > An I/O address, input/output address or port address, enables a device and a processor to exchange data
- > It must be unique
- > The device places data in the box for the CPU to pick up
- > The processor delivers the data to the appropriate device through the same I/O address
- > I/O addresses are addresses for the processor to distinguish among the devices with which it communicates

Memory Addresses

- > A memory address is a unique address assigned to memory chips installed anywhere in the system
- > The memory address is used by the CPU when it accesses information inside the chip
- > Memory addresses are shown as a range of hexadecimal addresses in Device Manager

Hardware Configuration Overview

Configuration of adapters and other hardware is easy if you follow the documentation and know how to obtain device drivers.

Installing Drivers

- > A driver is required when installing hardware or an adapter in the Windows environment
- > A driver is software that allows the operating system to control hardware
- > The operating system detects the adapter or hardware installation and adds the device's configuration information to the registry
- > The registry is a central database in Windows that holds hardware information and other data
- > All software applications access the registry for configuration information instead of going to the adapter

Installing a USB Device

- > 1. Power on the computer
- > 2. Install the USB device's software (optional)
- > 3. Power on the device (optional)
- > 4. Locate a USB port on the rear or front of the computer or on a USB hub. Plug the USB device into a free port
- > 5. Verify installation in Device Manager

Installing/Configuring USB Cards

- > 1. Power down the computer and remove the power cord
- > 2. Remove the computer cover. Locate an empty expansion slot
- > 3. Using proper anti-static procedures, ground yourself, or use anti-static gloves
- > 4. Attach a power connector to the adapter (optional)

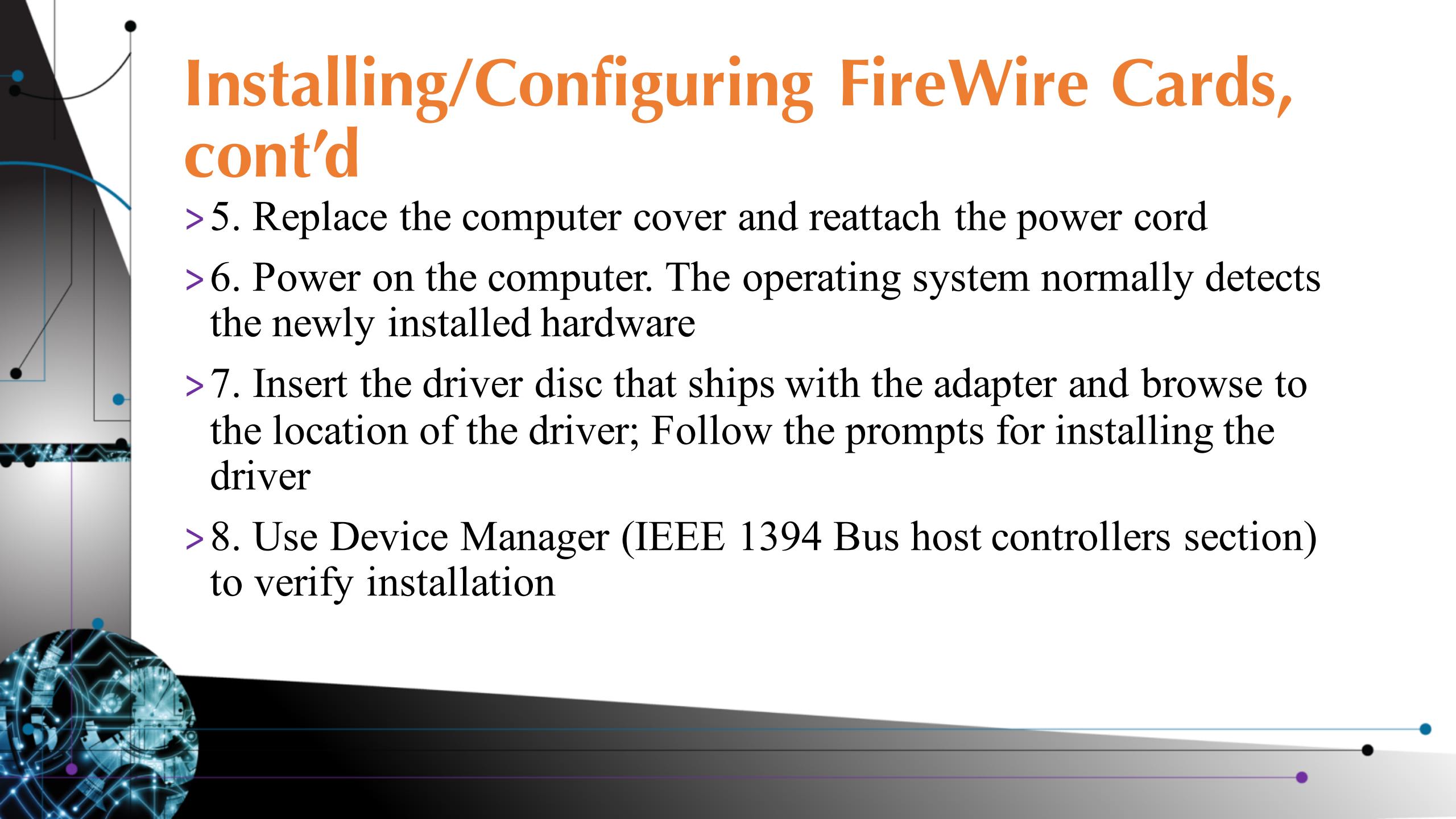
Installing/Configuring USB Cards

- > 5. Ensure the proper expansion slot is being used and insert the card firmly into the expansion slot
- > 6. Lower the expansion bar or attach a screw
- > 7. Reinstall the computer cover, reattach the power cord, and power on the computer; Install drivers as necessary
- > 8. Test by attaching a USB device to each port

Installing/Configuring FireWire Cards

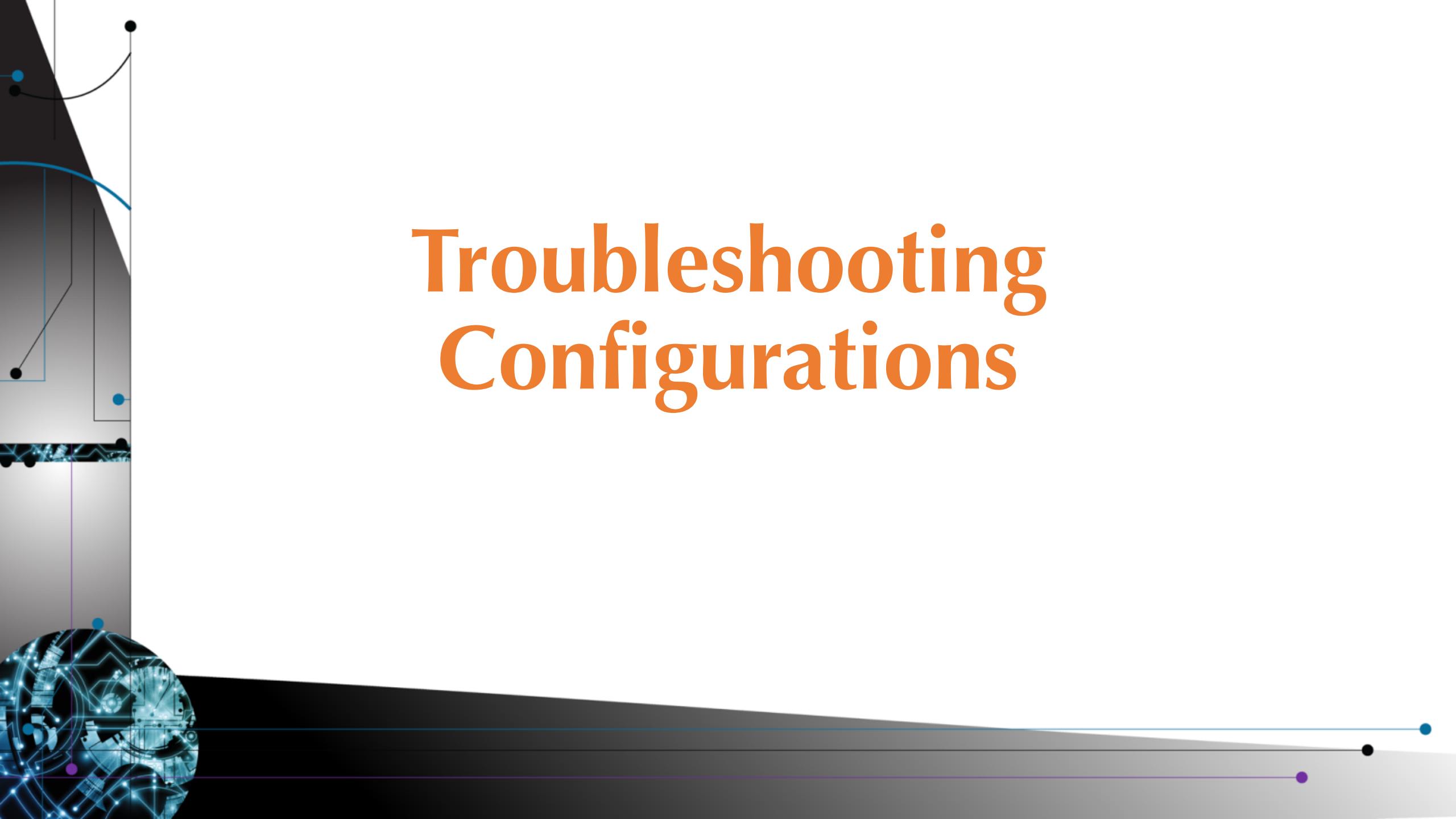
The following are generic steps for installing a FireWire adapter:

- > 1. Power off the computer and remove the AC power cord
- > 2. Remove the computer case so you can access the computer interior
- > 3. Locate an available expansion slot and optionally remove the slot cover and retaining screw
- > 4. Firmly insert the FireWire adapter into the expansion slot
- > 4. Reinsert the retaining screw, if necessary



Installing/Configuring FireWire Cards, cont'd

- > 5. Replace the computer cover and reattach the power cord
- > 6. Power on the computer. The operating system normally detects the newly installed hardware
- > 7. Insert the driver disc that ships with the adapter and browse to the location of the driver; Follow the prompts for installing the driver
- > 8. Use Device Manager (IEEE 1394 Bus host controllers section) to verify installation



Troubleshooting Configurations

Troubleshooting Configurations

Indications of a resource conflict (including IRQ, DMA, I/O address, and memory address conflict) are as follows:

- > The new device is installed and the new device or a previously installed device does not work
- > The computer locks up or restarts when performing a specific function, such as when playing or recording audio
- > The computer hangs during startup or shutdown
- > A device does not work properly or fails to work at all

Motherboard Battery

The most common CMOS battery used today is a CR2032 lithium battery, which is about the size of a nickel.

Motherboard Battery

- > High temperatures and powering devices that use batteries on and off shorten a battery's life span
- > Computer motherboard batteries last three to eight years
- > Replacing batteries is not the issue it once was



Motherboard battery

Computer Terms

Refer to the glossary terms at the end of the textbook chapter. Review Chapter 4 and become familiar with the terms.

This PPT deck was developed to support instruction of

The Complete CompTIA A+ Guide to IT Hardware and Software 7th Ed.

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